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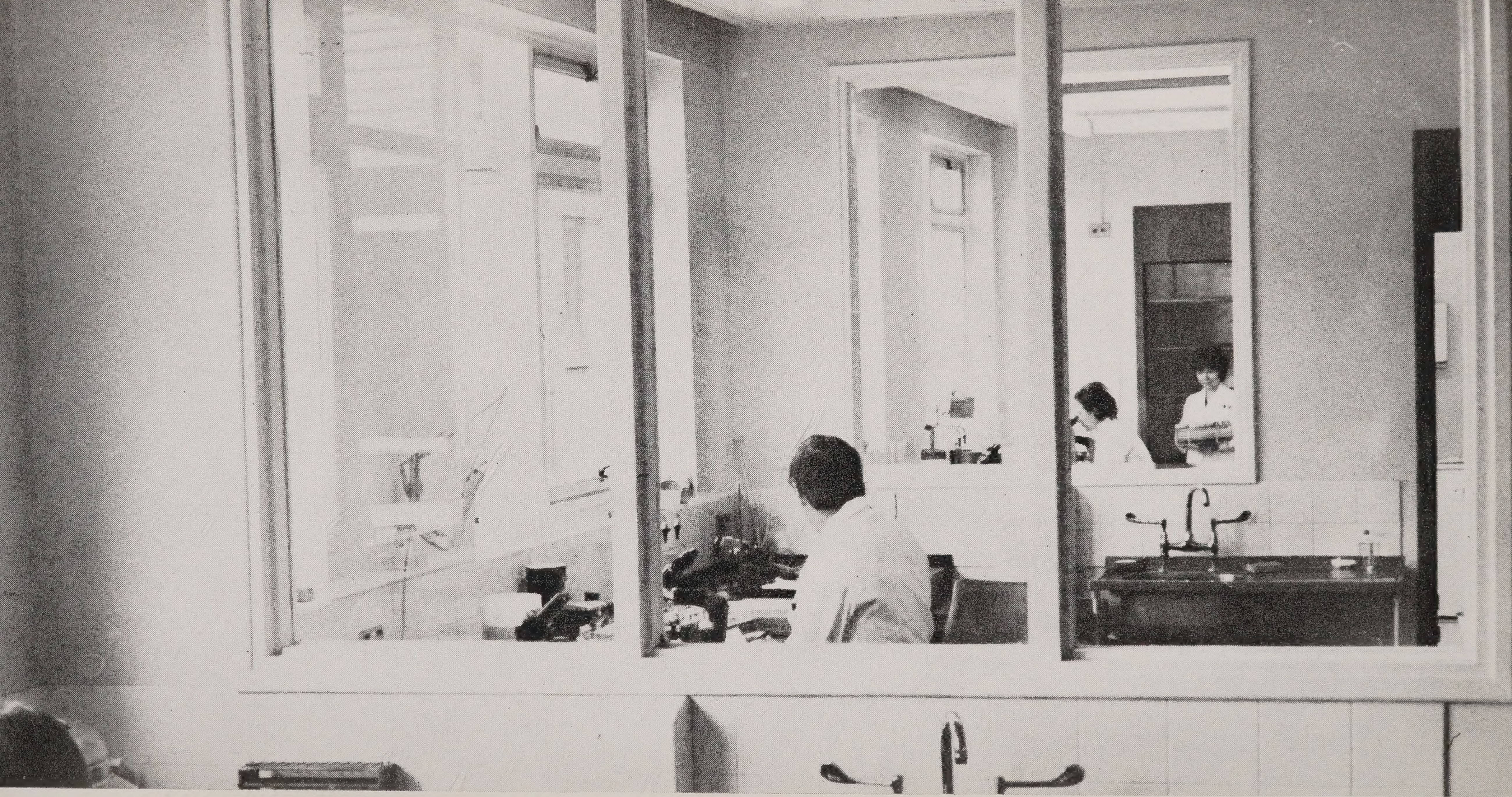
REGIONAL PUBLIC HEALTH LABORATORY, LEEDS
VIROLOGICAL DEPARTMENT
Photograph by G. E. Bellamy, F.I.M.L.T.,
Regional Public Health Laboratory, Leeds

Architects: Jones, Stocks and Partners, Leeds, in association with
P. B. Nash, Dipl.Arch., A.R.I.B.A., Dip.T.P.,
Architect to Leeds Regional Hospital Board



REGIONAL PUBLIC HEALTH LABORATORY, LEEDS
VIRUS ISOLATION SECTION
Photograph by G. E. Bellamy, F.I.M.L.T.,
Regional Public Health Laboratory, Leeds

Architects: Jones, Stocks and Partners, Leeds, in association with
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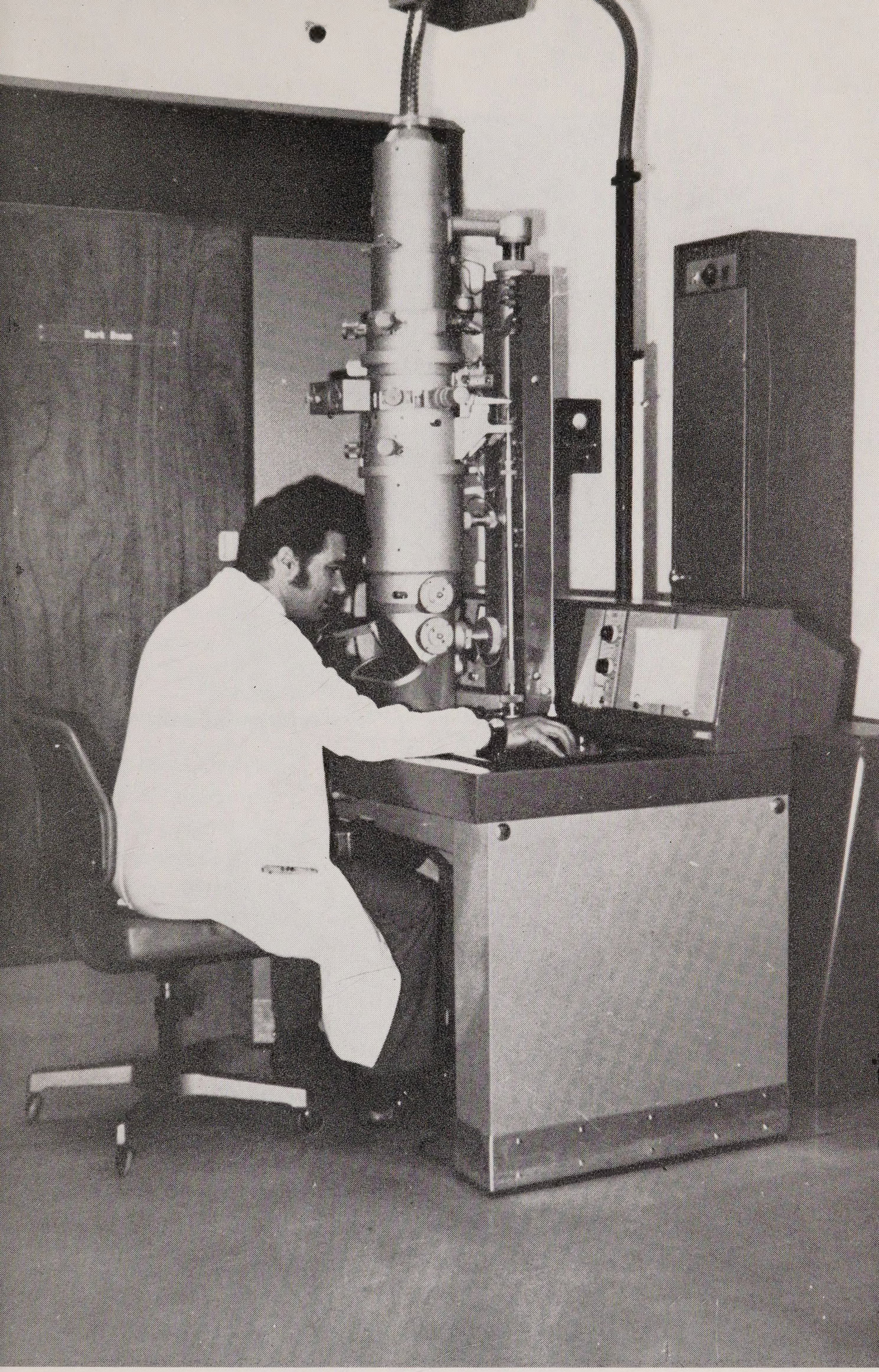
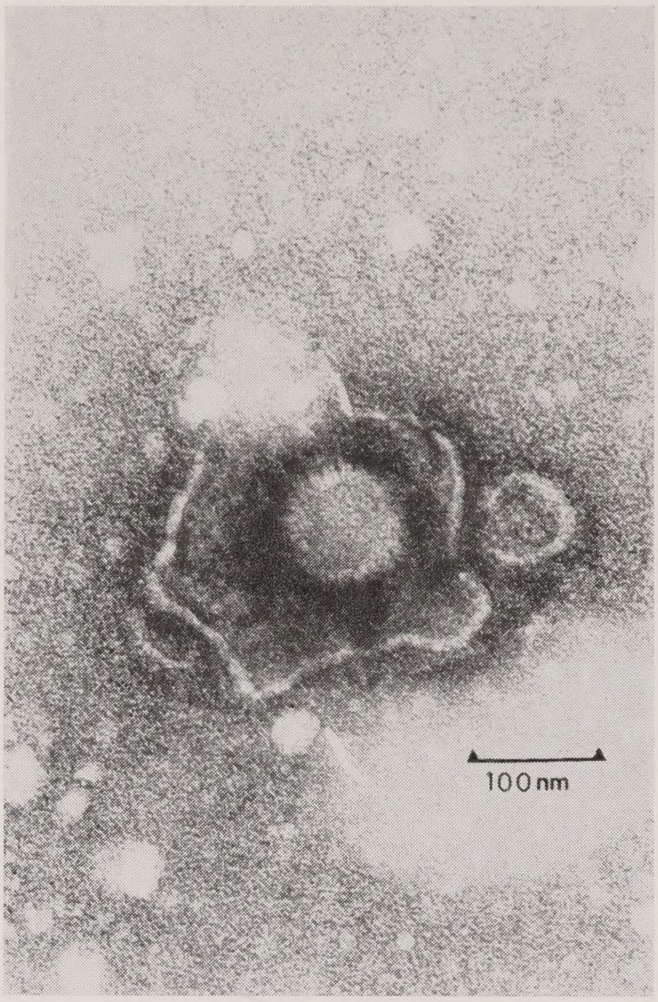
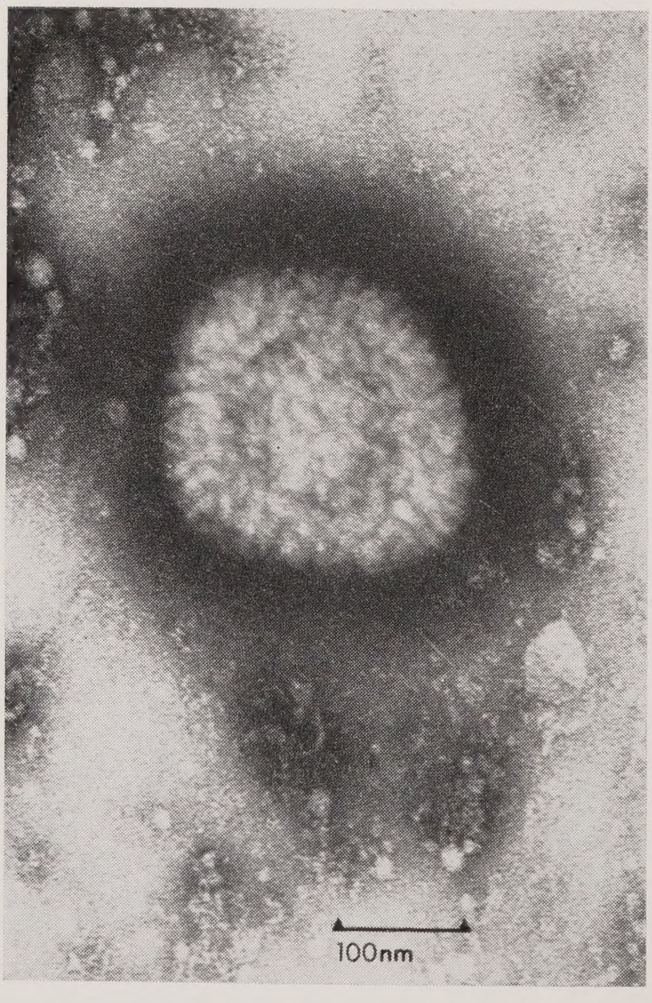


REGIONAL PUBLIC HEALTH LABORATORY, LEEDS
A.E.I. 801 ELECTRON MICROSCOPE



Electron micrograph of Herpesvirus varicellae from vesicle fluid.



Electron micrograph of Variola minor grown in tissue culture.

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THE PUBLIC HEALTH LABORATORY SERVICE BOARD

It was with great regret that the Board received the resignation, on grounds of ill health, of Dr. A. A. Driver, Senior Administrative Medical Officer of the Leeds Regional Hospital Board, who had been a member of the Board since 1965.

The Secretary of State for Social Services has appointed Dr. G. D. Duncan, Senior Administrative Medical Officer of the East Anglian Regional Hospital Board, to succeed Dr. Driver.

Since this edition of the Year Book was compiled, it is with great regret that the Board have to report the deaths of Dr. K. Patricia Carpenter, Director of the Dysentery Reference Laboratory since 1956, and of Dr. I. G. Murray, Director of the Mycological Reference Laboratory since 1961.

THE PUBLIC HEALTH LABORATORY SERVICE BOARD

Chairman: E. T. C. Spooner, C.M.G., M.D., F.R.C.P.
(late Dean, London School of Hygiene and Tropical Medicine, London)

Members: F. A. Adams, C.B.
(late Under-Secretary for Finance and Accountant General, Ministry of Health)

R. C. Bryant, C.B.
(late Under-Secretary, Board of Trade)

Professor A. C. Cunliffe, M.A., M.D., F.R.C.Path.
(Professor of Bacteriology, University of London, at King's College Hospital Medical School, London)

J. B. Meredith Davies, M.D., D.P.H.
(Director of Personal Health and Social Services, City of Liverpool)

G. D. Duncan, M.B., D.P.H.
(Senior Administrative Medical Officer, East Anglian Regional Hospital Board)

A. J. Essex-Cater, M.R.C.S., D.C.H., D.P.H., D.I.H., F.R.A.I.
(Medical Officer of Health, Monmouthshire County Council)

Professor K. McCarthy, M.D., F.R.C.Path.
(Professor of Medical Microbiology, University of Liverpool)

R. M. Shaw, C.B., M.B., D.P.H.
(Deputy Chief Medical Officer, Department of Health and Social Security)

Professor R. A. Shooter, M.A., M.D., F.R.C.P., F.R.C.Path.
(Professor of Bacteriology, University of London, at St. Bartholomew's Hospital Medical College, London)

C. E. Gordon Smith, C.B., M.D., F.R.C.P., F.R.C.Path.
(Dean, London School of Hygiene and Tropical Medicine, London)

C. C. Stevens, O.B.E., LL.B.
(Member of Manchester Regional Hospital Board; Chairman, Macclesfield and District Hospital Management Committee)

J. F. Warin, O.B.E., M.A., M.D., M.R.C.P., D.P.H.
(Medical Officer of Health, Oxford)

G. I. Watson, O.B.E., M.D., F.R.C.G.P., D.T.M. & H.
(Medical Practitioner, Peaslake, Surrey)

Professor N. P. L. Wildy, M.B., M.R.C.S., F.R.S.E.
(Professor of Virology and Bacteriology, University of Birmingham)

Staff Assessors to the Board:

B. Moore, M.D., B.Sc., F.R.C.Path., B.A.O.
M. T. Parker, M.D., F.R.C.Path., Dip.Bact.

Secretary:

J. D. Whittaker, M.B.E.

HEADQUARTERS ADMINISTRATIVE OFFICE

24 Park Crescent, London, W1N 4DA
Tel.: 01-636 2223

Sir James Howie, LL.D., M.D., F.R.C.P., F.R.C.Path. (*Director of the Service*)

J. C. Kelsey, M.D., F.R.C.Path., Dip.Bact. (*Deputy Director of the Service: see also* pages 29 and 40)

J. D. Whittaker, M.B.E. (*Secretary of the Board*)

R. H. Westlake (*Finance Officer and Deputy Secretary of the Board*)

J. W. Bushell (*Establishments Officer*)

R. V. Jackson (*Accountant and Supplies Officer*)

*A. Waltho (*Officer in Charge*), MRC Central Store, Colindale Avenue, London, NW9 5HT. *Tel.:* 01-205 0071

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* Member of the staff of the Medical Research Council.

INTRODUCTION

ADMINISTRATION AND ORGANISATION OF THE SERVICE

The Public Health Laboratory Service is the successor of the Emergency Public Health Laboratory Service planned, organised and administered during the war years 1939–1945 by the Medical Research Council, at the request of H.M. Government. In 1945 it was decided by the Government to retain the Service on a permanent footing. Statutory authority was provided by Section 17 of the National Health Service Act, 1946, which empowered the Minister of Health to provide a " bacteriological service " for the control of the spread of infectious diseases. Later the Medical Research Council agreed to an extension of the period of their administration, with the delegation of detailed responsibility to the Public Health Laboratory Service Board appointed by them for this purpose. In 1960, however, the Public Health Laboratory Service Act, 1960, established and incorporated a new Public Health Laboratory Service Board as a statutory body capable of acting in its own right as agent for the Minister. The Act also provided for the transfer of staff of the Service from the employment of the Council to that of the Board, and the transfer of property from the Council to the Minister of Health; these transfers took effect on 1st August, 1961.

The Chairman and members of the Public Health Laboratory Service Board are appointed by the Secretary of State for Social Services and, in accordance with the Schedule to the Act, the members must include the following (and must therefore be at least eight in number, in addition to the Chairman):

(*a*) not less than two persons appointed after consultation with the Medical Research Council;

(*b*) not less than two persons with experience as bacteriologists, appointed after consultation with such organisations as the Secretary of State thinks appropriate;

(*c*) not less than two persons holding office as medical officer of health to a local authority;

(*d*) not less than one person appointed after consultation with such organisations as appear to the Secretary of State to represent the hospital service;

(*e*) not less than one fully registered medical practitioner engaged in general medical practice, appointed after consultation with such organisations as the Secretary of State may recognise as representative of practitioners so engaged.

The Chairman and members of the Board are normally appointed for a term of three years.

The Board exercises its functions in accordance with any directions received from the Secretary of State for Social Services. In the exercise of these functions it acts as a principal.

The staff of the laboratories of the Service are appointed and employed by the Board. The directors of the constituent laboratories are whole-time medically qualified bacteriologists, with full consultant status. Professional staff are selected to a large extent from newly qualified medical graduates after they have held house appointments for 12 months or longer, they then receive five years' training in pathology and bacteriology. During the third year the trainee is required to obtain the Diploma in Bacteriology of the University of London or of the University of Manchester. The Service also receives fully trained recruits from the Hospital Service and from the universities. As a general rule, science graduates without medical qualifications are employed only in the reference laboratories (*see* page 40) where the work is of a highly specialised nature.

The technical staff of registered medical laboratory technicians are recruited from boys and girls leaving school at 16 to 17 years of age, who have attained the necessary standard of education; they go through a system of training in academic and practical subjects now becoming general in pathological laboratories throughout the country.

The development of the Service between 1946—in which year it was established in its present form—and 1970 may be summarised as follows:

	1948	1955	1962	1970
Number of Constituent Laboratories	36	56	59	63
Medical staff	84	124	132	244
Scientific staff		26	39	79
Technical, Clerical and Maintenance staff ..	562	778	956	1,246
Total specimens examined ..	793,314	1,689,033	2,314,126	3,702,000

SCOPE OF THE SERVICE

The Public Health Laboratory Service is designed to make the laboratory investigations needed to provide a continuous picture of the communicable microbial diseases of England and Wales. These diseases must be accurately defined by identifying the agents that cause them, by continuously seeking out and recording their whereabouts, and by investigating what really matters in promoting or limiting their spread. The activities of the P.H.L.S. allow useful advice to be offered to the central and local health authorities, and to others concerned with the control and prevention of these diseases.

The Service at present consists of 10 Regional Laboratories (*see* page 30), 53 Area Laboratories (*see* page 32), and 17 Reference and Special Laboratories (*see* page 40), most of the latter being grouped as the Central Public Health Laboratory at Colindale, London, NW9 5HT. Almost all the Regional and Area Laboratories are situated in hospitals, and in addition to their special functions within the Public Health Laboratory Service, act as the microbiological component of a group laboratory undertaking clinical work for the hospital staff, local general practitioners and medical officers of health. Specific public health work is also undertaken for medical officers of health over a wider area. In certain places where there is not a Public Health Laboratory, arrangements are made for this work to be done by a hospital bacteriologist acting for the Public Health Laboratory Service. Personal consultation between clinicians and the medical staff of local health authorities are welcomed. Members of the laboratory staff are prepared to investigate outbreaks of communicable disease in the field if asked to do so.

In certain circumstances Public Health Laboratories receive specimens from general practitioners outside the normal clinical area of the group laboratory; for example, specimens of public health interest requested by the medical officer of health, or specimens needed as part of one of the nationwide surveys which form a major activity of the Service. The Reference and Special Laboratories normally receive specimens only from other laboratories.

All specimens must be submitted by doctors, veterinarians, dentists, public health inspectors, and others acting on behalf of medical officers of health, Government Departments, or representatives of other official bodies; specimens cannot be accepted from private persons (see, however, sub-paragraph (*b*) below).

The routine specimens fall under two main heads:

(*a*) " Clinical " specimens received from hospitals, general practitioners and local health authorities. These are specimens of sputum, faeces, throat swabs, blood samples, etc., taken from persons suspected of suffering from (or being capable of transmitting) a microbial disease.

(*b*) " Sanitary " specimens: these are received from medical officers of health, public health inspectors, and others concerned officially with the control of the public health. They comprise specimens for bacteriological examination of water, shell-fish, watercress, sewage, milk and cream; of processed foods such as ice-cream, artificial cream and canned foods; and of imported products such as the various forms of meat, fish, processed egg, coconut and fertiliser. The Service normally examines only material offered to the consumer, but will, of course, examine specimens taken at any stage of production or distribution by medical officers of health investigating suspected food-borne infections. The Service is ready to give free advice to food manufacturers and processors to assist them in the production and distribution of bacteriologically safe products. For routine control of such products, commercial firms are charged a fee, but work of this sort is undertaken only exceptionally.

The epidemiological work of the Service includes not only the investigation of outbreaks of infectious disease, in co-operation with local medical officers of health, but also studies of the distribution and behaviour of infectious agents throughout England and Wales, and of the various aspects of the immunisation programme. Epidemiological information is collected centrally week by week from public health and hospital laboratories all over the country, including Scotland, Northern Ireland and Eire and then made available to each of these laboratories in turn in the form of a confidential weekly " Communicable Diseases Report ".

Field investigations of infectious disease, and field trials of protective agents, including vaccines, are frequently carried out. All laboratories are engaged to some extent in research in addition to routine work.

A special feature of the Service is the investigation of various problems by Working Parties containing a dozen or more members drawn from laboratories in different parts of the country. Some of the problems investigated are of direct concern to Government Departments, with which close working relations have always existed.

Brief mention has already been made of the reference laboratories and specialist departments. These provide facilities for the exact identification and " finger-printing " of organisms belonging to many different groups. This is sometimes required by clinicians in their treatment of patients, but more often for epidemiological purposes. The reference laboratories are freely available for consultation by any laboratory within or without the Service. Some of these typing facilities are available at regional and area laboratories; before sending specimens to a reference laboratory the local Public Health Laboratory Service Director should be consulted. In addition, a number of reference experts are retained for the examination of occasional specimens which require special skill, special knowledge, or special reagents.

The Service distributes various vaccines and sera on behalf of the Department of Health and Social Security. It also provides certain reagents for diagnostic purposes, prepared by or issued from the Standards Laboratory for Serological Reagents at the Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT (*see* page 42).

Directors of Public Health Laboratories are always prepared to discuss the facilities they can offer, either directly or through other units of the Service, and how these facilities may best be used.

GRANTS AND OTHER ASSISTANCE RECEIVED FOR SPECIAL INVESTIGATIONS IN 1970

The Public Health Laboratory Service Board now receive valuable assistance from the Departmental Research and Development Fund of the Ministry of Health. Allocations from this fund have enabled the Board to undertake the following important projects, involving research work of an " operational " nature:

The establishment of a special laboratory for the study and typing of mycoplasmas—this being a necessary preliminary step towards the provision by the Service of reference facilities for these organisms.

Laboratory investigations into farmers' lung.

An investigation of laminar flow ventilation and the determination of its effectiveness in protecting hospital patients who are at special risk to cross-infection.

Research on infectious hepatitis. The purchase of marmosets to be used in the investigation.

Research on non-bacterial enteritis

The establishment of reference facilities for monitoring transferable drug resistance.

The surveillance of whooping cough and B.C.G. vaccines.

The Board also receive grants from the following bodies for the assistance of special investigations and the acquisition of major equipment of a special nature:

From the World Health Organisation:

$3,500 for the assistance of laboratory research on enteric phage-typing at the International Centre recognised at the Enteric Reference Laboratory, Colindale, London.

$3,500 for the International Shigella Centre recognised at the Dysentery Reference Laboratory, Colindale, London.

$3,000 for the International Reference Centre for Staphylococcal Phage-typing recognised at the Cross-Infection Reference Laboratory, Colindale, London.

$1,000 towards the cost of testing the specificity of virus antisera at the Standards Laboratory for Serological Reagents, Colindale, London.

$2,500 for the preparation and testing of reagents (rhinovirus), at the Virus Reference Laboratory, Colindale, London.

$4,000 towards the cost of epidemiological serological investigations of tropical sera for antibodies in treponematoses at the Venereal Diseases Reference Laboratory, London Hospital Research Laboratories, London.

Grants are held by the following individual members of the Board's staff:

(*a*) From the Medical Research Council:

Dr. I. G. Murray (Director, Mycological Reference Laboratory, London School of Hygiene and Tropical Medicine).

Provision for research in serological methods in the classification of pathogenic fungi and in the diagnosis of mycoses.

Dr. P. G. Higgins (Virologist, Epidemiological Research Unit, Cirencester).

Provision for research into the application of organ cultures to the diagnosis and epidemiology of virus infections in the general community.

Dr. J. O'H. Tobin (Director, Public Health Laboratory, Manchester).

Provision for research on cytomegalovirus infections.

(*b*) From the British Diabetic Association:

Dr. D. G. Gamble (Director, Public Health Laboratory, Epsom).

Provision for an investigation into certain aspects of viral pancreatitis, and the part played by viral infection in the development of diabetes, with particular reference to coxsackie virus infection.

In addition to the provision of research grants described above, two research projects are in progress jointly with the Medical Research Council, in which members of the Council's scientific staff are collaborating. These are as follows:

Research work on viruses at the Epidemiological Research Unit, Cirencester, Gloucestershire;

Various studies at the Cross-Infection Reference Laboratory, Colindale Avenue, London, NW9 5HT.

Laboratory Directors in the Service are also carrying out investigations in conjunction with general practitioners and hospital medical officers in many places, notably in the study of chronic bronchitis, of hospital cross-infection, and of sterilisation and disinfection problems; on gastro-enteritis and the safety of various foods.

A clause of the Schedule of the Public Health Laboratory Service Act, 1960 permits the Board to accept, hold and administer private gifts on trust for any purpose related to the Public Health Laboratory Service or otherwise connected with bacteriological research.

REVIEW BY THE DIRECTOR OF THE SERVICE OF ACTIVITIES IN 1970

LABORATORIES

The Public Health Laboratory at East Birmingham Hospital was officially opened on 11th March, 1970. The Laboratory moved to its new premises in November 1969.

The Southend Public Health Laboratory moved to its new premises at the Southend General Hospital on 1st April, 1970.

The new Public Health Laboratory at Whipps Cross Hospital was formally opened on 4th June, 1970.

RETIREMENTS AND RESIGNATIONS

Dr. R. Blowers, who joined the Public Health Laboratory Service in 1949 and has been Director of the Public Health Laboratory at Middlesbrough since 1951, resigned on 31st August, 1970 to take up the post of Head of the Division of Hospital Infection, Clinical Research Centre at the new hospital at Northwick Park.

Dr. A. D. Macrae, who has been a member of the Public Health Laboratory Service since 1946 and Director of the Virus Reference Laboratory, Colindale, since 1961 resigned on 31st August, 1970 to take up the appointment of Consultant Virologist at the City Hospital, Edinburgh.

Dr. Joan Taylor who joined the Emergency Public Health Laboratory Service in 1939 and has been Director of the Salmonella Reference Laboratory, Colindale, since 1945, retired on 19th October, 1970.

Professor Scott Thomson, who joined the P.H.L.S. in 1946 as Director of the Regional Public Health Laboratory at Cardiff, resigned on 31st July, 1970 to accept the appointment of whole-time Professor of Bacteriology in the Welsh National School of Medicine, University of Wales and as Head of laboratories in the region. Professor Scott Thomson has been offered and has accepted honorary consultant status with the Public Health Laboratory Service.

APPOINTMENTS

Dr. C. H. L. Howells was appointed Consultant Bacteriologist, Director of the Regional Public Health Laboratory, Cardiff. He will take up his post during 1971.

Dr. P. R. Mortimer was appointed Consultant Bacteriologist, Director of the Area Public Health Laboratory, Teesside (formerly Middlesbrough), from 1st November, 1970.

Dr. Marguerite S. Pereira, Consultant Virologist, was appointed Director of the Virus Reference Laboratory, Colindale, from 1st December, 1970.

Dr. J. V. S. Pether was appointed to the post of Consultant Bacteriologist, Director of the Taunton Public Health Laboratory from 1st November, 1970.

Dr. B. Rowe was appointed Consultant Bacteriologist, Director of the Salmonella Reference Laboratory, Colindale, from 1st December, 1970.

Dr. B. T. Thom was appointed Consultant Bacteriologist, Director of the Public Health Laboratory at Whipps Cross Hospital from the opening of the Laboratory in June 1970.

LOCUMS

We are most grateful to the following people for help with locum duties: Dr. J. A. Boycott at Taunton and Dr. R. Norton at Sunderland.

SECONDMENTS ABROAD

Dr. J. Craske of the Virus Reference Laboratory, Colindale returned from his secondment to the Department of Virology and Epidemiology of Baylor University College of Medicine, Houston, Texas during October 1970.

Mr. T. J. Donovan, Chief Technician at the Maidstone Public Health Laboratory continued his secondment in Karachi at the Jinnah Postgraduate Medical Centre. His secondment is for two years from October 1969.

VISITS ABROAD

Dr. J. D. Abbott visited Professor A. Charlotte Ruys at the University of Amsterdam to study methods used in the investigation of meningococci.

Dr. E. S. Anderson was one of several people who attended the Xth International Congress for Microbiology held in Mexico City in August 1970. As well as attending the Congress Dr. Anderson also attended pre-congress preparatory meetings in Mexico. He took the opportunity of investigating the prevalence and control of enteric fevers in Mexico. After the Congress Dr. Anderson went to the University of California and Stanford University Medical Centre to give lectures at the invitation of the universities. Earlier in the year Dr. Anderson took part in a Colloquium on Drug Resistance in Enterobacteria which was held in Berne. In June Dr. Anderson attended the Annual General Meeting of the Editorial Committee of the Annals of the Pasteur Institute.

While in Paris for this meeting he had discussions with Dr. P. Nicholle about the Mexico Congress in August. At the invitation of Dr. A. Laskin, Dr. Anderson visited New York to attend a Conference on the Problems of Drug Resistant Pathogenic Bacteria under the auspicies of the Esso Research and Engineering Company.

Dr. R. Blowers visited Russia with Dr. J. C. Kelsey to see various institutions in the Public Health field in the U.S.S.R. Dr. Blowers also attended the Microbiology Congress held in Mexico City during August 1970. He also took part in the International Conference on Hospital Infections held in Atlanta. He had been asked to act as Chairman of one of the Sessions.

Dr. K. Patricia Carpenter was another member of the Public Health Laboratory Service who attended the Mexico Congress on Microbiology.

Dr. Yvonne E. Cossart attended the Symposium on Virus Hepatitis Antigens and Antibodies which was held in Munich, Germany, during August 1970.

Dr. D. G. ff. Edward took part in the Xth Conference on Taxonomy that was held in Brno, Czechoslovakia during September.

Dr. Anne M. Field visited four laboratories in the U.S.A. to study their work on ultra-thin sections for high resolution electron microscopy, in order to learn new techniques for use in the Virus Reference Laboratory.

Dr. A. L. Furniss went again to the Cholera Research Laboratory, Dacca, East Pakistan, to continue his work concerned with the organisation and running of the bacteriological laboratory.

Along with two other members of the P.H.L.S. Dr. Sylvia D. Gardner attended an International Conference on Cytomegalovirus Infections held at St. Gall, Switzerland, during April 1970.

Dr. R. J. Henderson accepted an invitation from the World Health Organization to visit India, Ceylon, Thailand, Burma, and Indonesia to carry out a survey and report to WHO on microbiological services in the South East Regional Organisation of WHO. Later, he also visited Turkey to advise on arrangements for training medical laboratory technicians. Before going to Turkey Dr. Henderson visited Copenhagen to discuss the training project with Dr. M. R. Radovanovic of the World Health Organization Regional Office for Europe.

Dr. Betty C. Hobbs visited India to meet representatives of the World Health Organization at the Indian Ministry of Agriculture and staff of the Institute of Food Technology, Mysore, to discuss laboratory aspects of food examination in India and also to return to the Christian Medical College and Brown Memorial Hospital, Ludhiana. Dr. Hobbs went to the Mexico City Congress on Microbiology. While in Mexico she also attended meetings of the International Committee on Microbiological Specifications for Food. She also took part in a Symposium organised by the Permanent Section on Food Microbiology and Hygiene of IAMS. In October Dr. Hobbs went to attend a Symposium on the Microbiology of Semi-preserved Food, in her capacity as Vice-Chairman of the IAMS Committee. She took the opportunity of visiting other laboratories in Czechoslovakia and Warsaw.

During August 1970, Sir James Howie visited Atlanta, U.S.A., to attend the International Conference on Nosocomial Infections. At the beginning of November Sir James went to Dacca, East Pakistan, to attend as United Kingdom representative a meeting of the Technical Committee of the Pakistan-SEATO Cholera Research Laboratory. From Dacca, Sir James travelled to New Delhi, India, to visit various laboratories and to take part in the WHO Conference on the organisation of Health Laboratory Services, in the South-East Asia Region.

Dr. L. Hoyle accepted an invitation to give a lecture at the IIIrd ICRO/UNESCO Training Course on " Interaction between Animal Viruses and Host Cells ". This was held in Bratislava during September. On the way back Dr. Hoyle visited Professor R. Rott in Giessen to discuss recent developments in the study of influenza virus Neuraminidase.

Dr. D. M. Jones presented a paper at the VIIth Congress of the European Dialysis and Transplant Association which was held during June in Barcelona.

Dr. J. C. Kelsey went with Dr. Blowers to Russia to see various institutions in the public health field in U.S.S.R. Dr. Kelsey also attended the International Conference on Hospital Infections held during August in Atlanta. This followed from Dr. Kelsey's attendance at the initial planning meeting of this conference when he was in Chicago in 1969. Dr. Kelsey visited Hamburg in June to take part in a Colloquium on Hospital Disinfectants.

Dr. S. P. Lapage attended the Mexico City Congress and while there he went to meetings of the International Committee on Nomenclature of Bacteria, the Judicial Commission, and the Drafting Committee on the Bacteriological Code. Dr. Lapage extended his visit to Ottawa to visit the Curator of the Canadian Culture Collection and to Washington for discussions with the Director of the American Collection. He also spent time in Atlanta and at Rutgers University, New Brunswick, for discussions with Dr. Ruth Gordon.

Dr. Hélène J. Mair attended the International Conference on Cytomegalovirus Infections at St. Gall in Switzerland during April.. She also accompanied her husband, Dr. N. S. Mair, to the University of Michigan where he gave the second Wheeler Memorial Lecture at the School of Public Health. Dr. N. S. Mair also gave a lecture in Boston and went to Atlanta in early May. He also attended the Mexico City Congress on Microbiology.

Dr. Christine L. Miller and Dr. D. L. Miller both attended the International Congress on the Application of Vaccines against Viral Rickettsial and Bacterial Diseases of Man. This Congress was held in Washington during December 1970. Dr. D. L. Miller took the opportunity of visiting the Communicable Disease Center in Atlanta, the Hagerstown Community Project, and the Tecumseh Community Research Project.

Dr. B. Moore accepted an invitation to lead the discussion on ascertainment of hospital infection with particular reference to the employment of Infection Control Sisters, at the International Conference on Hospital Infection, held in Atlanta during August.

Dr. I. G. Murray went to Leipzig during May to submit a paper to Gesellschaft Für Medizinische Mycologie Der DDR. Dr. Murray also went to Vienna to attend the Vth International Congress of Infectious Diseases. He accepted an invitation to attend a meeting of the Société Suisse de Medecine Tropicale et de Parasitologie which was held in Innsbruck, Austria.

Dr. Marguerite S. Pereira attended the International Congress for Microbiology held in Mexico City where she read a paper on the association of viruses with clinical pertussis.

In August, Dr. C. E. D. Taylor attended the Mexico City Microbiology Congress and read a paper. The following month Dr. Taylor accepted an invitation to attend a Council Meeting of the World Association of Anatomic and Clinical Pathology Societies and the Annual Convention of the American Association of Clinical Pathologists which was held in Atlanta. While in Atlanta Dr. Taylor had discussions with Dr. W. B. Cherry, Chief of the Bacterial Chemistry Unit at the National Communicable Disease Center.

During May Dr. Joan Taylor visited the United States of America. The main purpose of her visit was to attend the Conference on Neonatal Enteric Infections caused by *E. coli* which was held in New York. Dr. Taylor also went to the Walter Reid Hospital, Washington to lecture.

Dr. J. O'H. Tobin attended the International Conference on Cytomegalic Infections held in St. Gall, Switzerland during April.

Dr. L. H. Turner attended the Mexico City Congress in his capacity as Secretary of the Leptospirosis Sub-Committee.

VISITING WORKERS

Many people spent periods at the laboratories at Colindale, Bradford, Carmarthen, Chelmsford, Cirencester, Exeter, Guildford, Leeds, Manchester, Northallerton, Portsmouth, Preston, Sunderland, Swansea, Tuberculosis Reference Laboratory, and the Venereal Diseases Reference Laboratory.

ROUTINE WORK OF THE SERVICE

In 1970 the 63 Regional and Area Laboratories of the Service examined 3,702,000 specimens (an increase of 4 per cent on last year's figures), of which 216,000 were virological (an increase of 11 per cent on last year's figures). As before, the work came from hospitals, local health authorities, general medical practitioners, and veterinarians. The routine work continued to provide the basis for numerous epidemiological investigations and for a number of surveys. The extent and nature of these activities may be judged from the committees and working parties (pages 59–65, Appendix I) and to lists of published papers (pages 66–77, Appendix II).

SCIENTIFIC WORK

*The Work of an Area Laboratory.** The obligation to provide a diagnostic service for a community can be burdensome, but the rewards for attempting it can include a sharp awareness of the changing seasonal pattern of communicable disease. The day-to-day experiences of a service laboratory offer better information on the whereabouts of microbes than any paper-based system of notification.

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*Contributed by the Director of an Area Laboratory.

Hospital services in the south-west of England are organised around clinical areas. These are socially coherent units with populations of about half a million, each long accustomed to look to a medium-sized town as its centre. Association of a Public Health Laboratory with a hospital in such a centre is a valuable means of gathering information about infectious disease throughout the clinical area, since general practitioners look to such hospitals for many services, and the laboratory so sited can survey the whole scene from periphery to hospital bed. Physical features such as the Mendips, Salisbury Plain, the Cotswolds and the location of thermal springs have helped to form the local pattern. For the future one must expect changes in the life and orientations of the community as the national network of motorways penetrates our neighbourhood.

Outstanding features of life in a hospital-associated Public Health Laboratory are the variety of calls to be answered and the value of personal relations with a large number of medical, public health and veterinary colleagues. In the search for information it is useful to supplement the routine diagnostic load by specific surveillance programmes, organised for their epidemiological interest rather than their immediate bearing on the problems of individual patients. Simple transport media have greatly improved the prospects of isolating viruses from swabs taken by general practitioners; and a weekly quota from early cases of respiratory infection seen in selected practices forms a useful picture of the distribution of infection. This year we have examined close on 900 such swabs, isolating viruses other than Herpes Simplex from 214 (25 per cent). Understandably Influenza A_2 dominated the field, but it was encouraging to find that the first isolations preceded our main epidemic by several weeks and were even further ahead of warning signs in the figures for sickness-benefit claims. When there was a sharp burst of absenteeism in the schools later in the year it was comforting to see that this was due to Influenza B, and interesting to find the virus still present and active among us late in summery June. Less spectacular, but also encouraging, is the usefulness of prompt diagnosis of viral meningitis in helping general practitioners to deal more confidently with local outbreaks.

Links with our veterinary colleagues are perennially valuable in relation to salmonella infections and undulant fever. This year variety was added by the problems of a laboratory community involved in the lambing of a small group of ewes infected by *R. burneti*, and by a share in unravelling the deaths of five West African parrots that succumbed to an avian strain of Influenza A.

With our public health colleagues we once more took up the cudgels against Sonne dysentery. With the help of health visitors investigating all absentees, the selective application of bacteriology, and the use of paromomycin for the cure of cases we were glad that a socially important day-nursery was kept going that would otherwise have become miserably infected and might have faced a period of closure. In another township efforts to secure control in an infected primary school met with chastening defeat, but provided interesting confirmation of the ease with which this shigella can be isolated from lavatory seats. The safety of water is also our constant care, and it is sad to report that little satisfaction came from this important sector, which is still bedevilled by poor personal relations.

The extent and value of the consultative function of a Public Health Laboratory have been described in other accounts. Even though a fully satisfactory final solution is often not forthcoming it seems that a useful service is provided by listening sympathetically to an ordered account of a problem, and discussing the possibilities. From the hospital itself comes a continuing series of calls for advice and help with the many facets of a control of infection service. Local initiative having produced 10 years ago an isolation unit to deal with hospital-acquired staphylococcal disease, we are faced with a changing pattern of infection that calls for continued review of isolation policy to ensure the best use of valuable beds. This year the problem of pseudomonas infections bids fair to supplant staphylococcal disease. Central sterile supply, autoclave policy, the planned use of disinfectants on the wards, chemotherapy policy, and economy in using antimicrobial drugs are topics on which help has been requested. One hardly remembers now the battles of former years to secure the renovation of ward sanitary annexes, the reorientation of sterilisation of surgical instruments, the universal use of sterile, disposable needles and syringes, and the general acceptance of paper hand-towels in place of the unattainable luxury of instant clean linen for all.

Our two-year-old Postgraduate Medical Centre is now so much a part of life that it is not clear how affairs were ever managed without it. Regular courses of lunch-time lectures draw general practitioners in from the periphery. Last autumn the topic was the management of infective diseases in general practice, with two sessions specifically devoted to the rational use of the laboratory. Even though psychiatry is the subject for this winter, the occasion is still provided for meeting colleagues who might otherwise be known only as telephone voices. Beyond this, meetings of the Clinical Society, medical rounds, faculty meetings, and journal clubs provide more opportunities than can be accepted for meeting hospital colleagues of all grades and offering comments appropriate from a microbiologist, while keeping a mind broadly open to medicine as a whole. As travel becomes more a part of everyone's life, exotic diseases are more prone to appear among our patients and some experience of medicine overseas can prove useful. The year has already produced its quota of hepatic amoebiasis and unsuspected malaria, together with requests for advice on schistosomiasis.

Freedom to investigate is not the least important component in the year's work. Topics are often found in the service load. Help is readily given by colleagues for whom a service is provided. This year the apparent preponderance of *Proteus* as a cause of urinary symptoms among small boys, in contrast with the coliforms that attack their sisters, has led us to look at the flora of the preputial sac and to enquire into the nature of the contamination an unretracted foreskin may contribute to a clean-catch urine specimen. In the autumn, the British Medical Association visited our town for its Annual Clinical Meeting, and it was a pleasure to provide a P.H.L.S. contribution to a demonstration illustrating Research in a Regional Hospital Board, drawing for this on work done to show the value of dip-inoculum culture as a means of serving communities remote from a central bacteriological laboratory. Having accepted responsibility for Schick testing student nurses entering the training school here, the opportunity is provided of recording the present patterns of reactions and considering their likely significance.

The four strands of service, surveillance, consultation, and investigation form a reasonably substantial rope. Life may be busy, but it is seldom dull and frequently rewarding.

Committee on Infection Risks of Haemodialysis: Recent Developments. This working party was set up in 1967 to study the various microbiological problems associated with haemodialysis units. Its first report[1] was in the main a review of the special context of dialysis unit infections by a group of working microbiologists with experience of hospital cross-infection in other fields. Various recommendations were made on dialysis unit management and hygiene, on the measures needed to protect patients and staff, and on the disinfectants that were most likely to be effective for decontaminating dialysis unit equipment.

Three areas of special interest were defined in this preliminary report. The somewhat uneven progress of the past two years in these three areas may be summarised as follows:

(i) *The problem of dialysis unit hepatitis.* By the summer of 1969, the advent of Australia antigen tests had transformed the prospect for rapid identification of the dangerous carrier of hepatitis virus B and of infected blood donations. Recent work in this field is described elsewhere in this year book by two members of the working party.

Although the use of immunological techniques has provided a rational basis for the long-term elimination of hepatitis from dialysis units, the identification of antigen-positive patients has increased the immediate urgency of measures for the protection of medical, nursing and technical staffs. At the time of writing, the committee under the chairmanship of Lord Rosenheim has not yet made its report on the measures called for by the recent outbreaks of dialysis unit hepatitis, particularly in Edinburgh. Members of the working party are however actively studying the need for isolation facilities and the use of disposable gowns and trousers by dialysis-unit staff or of protective ventilated suits as worn by certain categories of industrial worker. Dressing packs are being designed with the safety of attendant staff as well as of the patient in mind. The daily routine of dialysis units and of associated pathology laboratories is also being studied at close quarters by the same techniques that have been applied to the study of cross-infection in operating theatres and intensive-care units. The problem of educating in aseptic techniques personnel with no microbiological experience is still a formidable one.

(ii) *The problems of shunt sepsis.* During the past two years, increasing use of the Brescia-Cimino internal arteriovenous fistula has eased the problem of shunt sepsis. Little concern on this score was voiced at a useful meeting of British microbiologists associated with dialysis units sponsored by the working party in March 1970. Attention has been drawn to the difficulty, however, of preventing environmental contamination with the patient's blood when patients with the Brescia-Cimino fistula are being trained for home dialysis.

(iii) *The hygiene of dialysis unit equipment.* The complex equipment needed for specialised hospital units has notoriously not always been designed to meet bacteriological requirements. Dialysis unit equipment is no exception. Various difficulties have hampered the working party's progress in this field. First, by a curious paradox, the fact that high bacterial counts in dialyser effluents may not be associated with ill effects to patients has sometimes encouraged the view that high bacteriological standards are unnecessary. In a number of units, on the other hand, high bacterial counts in dialysis fluids have been associated with rigors in the patients undergoing dialysis, and Dr. Jones of Manchester has reported septicaemia as a consequence of *Pseudomonas aeruginosa* multiplying under a dialyser gasket. Clearly a rational code of practice for the decontamination and sterilisation of dialysers must at least aim at near-sterility of the dialyser during use.

Proportionating systems with a built-in pasteurising cycle have helped greatly to reduce the level of bacterial contamination of the dialyser inflow, but further work is necessary on the hygiene of the dialyser and its monitoring attachments. Much of this equipment will not stand heating, and the choice of suitable disinfectants is restricted. Members of the working party have discussed these difficulties with the Microbiological Research Establishment at Porton, and the choice of appropriate disinfection procedures is still under study.

Two of the laboratories represented on the working party are actively engaged in this field. In Manchester, Dr. Jones and his colleagues[2, 3] have shown that at a time when rigors in dialysis unit patients were particularly common, bacteria were multiplying in parts of the gasket system of Kiil dialysers that were inaccessible to disinfectants. This problem was overcome by a simple modification of the gaskets. In Exeter, the chemical engineering department of the University and the Public Health Laboratory are collaborating in a critical study aimed at correlating bacterial multiplication in dialysers and monitoring devices with the flow characteristics of the assembled equipment. This study should provide useful ideas on design. In addition, the equipment under test will be experimentally infected with indicator organisms and the effectiveness of various disinfectants evaluated.

REFERENCES

1. Public Health Laboratory Service (1968). *Brit. med. J.*, **3**, 454.
2. Jones, D. M., Tobin, Barbara M., Harlow, G. R. and Ralston, A. J. (1970). *ibid.*, **3**, 135.
3. Tobin, Barbara M., Ralston, A. J. and Jones, D. M. (1970). *ibid.*, **3**, 226.

Survey in Dialysis Units. It is now well established that hepatitis is a particular hazard to patients and staff in dialysis units. General awareness of the problem resulted from reports of outbreaks in units in the United Kingdom and in other countries.

Reports of outbreaks are valuable for drawing attention to, and providing some information about, the problem; but they form an unreliable basis for assessments of the general risk to patients and staff in dialysis units. This is so for several reasons: firstly, reports of some outbreaks may not be published or may be published only long after the event; secondly, methods of analysis of the findings are rarely similar in all reports; and lastly, some accounts of the absence of hepatitis are not published. Moreover, the number of haemodialysis units and the number of patients under treatment in the United Kingdom increase each year. The hepatitis risk in dialysis units cannot be reliably assessed unless many individual units regularly supply standard information for analysis. Not only is this information necessary for assessment of the risk of hepatitis but it is essential for the evaluation of possible methods of prevention.

Normal human immunoglobulin is the only material available at present for the prophylaxis of hepatitis. Its usefulness is established in the prevention of overt attacks of infectious hepatitis (short-incubation period) but it is of doubtful value in the prevention of serum hepatitis (long-incubation period). Epidemiological evidence suggests that in dialysis units the majority of outbreaks are of serum hepatitis.

A survey was begun in January 1968 with the collaboration of consultants in charge of the majority of dialysis units in the United Kingdom. The aims of the study were to determine the incidence of hepatitis in patients and staff in the units and to assess the incidence in relation to the prophylactic use of human immunoglobulin.

Personal records were completed for all patients and staff in the collaborating units. Special records were completed for all cases of hepatitis. For staff who had left the unit permanently, inquiries were made by post to discover whether they had had jaundice within six months of the date of leaving.

A controlled trial to assess the prophylactic value of human immunoglobulin was not considered feasible. Whether or not immunoglobulin was used was decided by the consultant in charge of each unit. In less than half of the units doses were offered to staff at regular intervals. In the remainder doses were not offered except in the presence or apparent threat of an outbreak of hepatitis.

Results of the first year of the survey (1968) showed that there had not been new outbreaks of hepatitis in any of the survey units although one outbreak, which was in progress before the survey began, continued. It seemed possible that several non-specific measures—such as a reduction in the number of blood transfusions, improvements of premises, equipment and general conditions within the units, together with an increased awareness of the need for precautions to avoid infections—were combining to prevent outbreaks of hepatitis. But the results in 1969 showed that this was not so: three new outbreaks of hepatitis began in the survey units in 1969, and in 20 units included in the survey from 1968 the attack rates of hepatitis in 1969 in both patients and staff were treble the corresponding rates in 1968.

Information about the value of human immunoglobulin is inconclusive. There is no evidence that the general use of immunoglobulin after cases of hepatitis began to appear affected the course of any of the outbreaks which arose during the period of the survey.

The possibility of adding specific laboratory investigations to the original study was presented by the discovery of an antigen—the Australia or Hepatitis Associated Antigen—in the blood of patients with serum hepatitis. In July 1969 a pilot study was made to detect Hepatitis Associated Antigen in serum samples from patients in 18 dialysis units. The results showed a clear association between the appearance of outbreaks of hepatitis and the presence of the antigen. In each of four units with outbreaks which began or continued in 1969 the antigen was found in the serum of one or more patients. The antigen was not detected in any samples from the other 14 units in which there were no outbreaks of hepatitis during the period of the survey—that is, during 1968 and 1969.

It has been generally believed for some time that the outbreaks of hepatitis in dialysis units and their continuance are dependent upon persistent carriage of the infecting agent by patients without clinical evidence of hepatitis. This view was confirmed by laboratory tests of serum samples from patients in the survey units. The observations made during and after the pilot survey indicated that prospective studies in units in which there had not been outbreaks of hepatitis might afford valuable information.

In January 1970 an investigation of the value of regular screening tests for Hepatitis Association Antigen were begun. The objects of the study were to find how the antigen is introduced into dialysis units, to detect carriers of the antigen, and to determine whether spread of infection could be prevented by removing cases and carriers of the antigen from the units.

Specimens of serum from all patients and staff in the collaborating units were tested at the outset. Subsequent tests were made of sera from all patients at regular three-monthly intervals. Specimens from all newcomers to the units were tested.

Blood intended to be transfused to patients in the unit was tested before use whenever possible. Blood transfused in an emergency was tested retrospectively.

When the antigen was found in a specimen efforts were made to remove the carrier from the open unit. Samples from all patients and staff in the units concerned were tested at weekly or two-weekly intervals until the likelihood of an outbreak was considered to have passed or until an outbreak was considered to have ended.

Preliminary results of the studies in 1970 indicate that regular screening tests for Hepatitis Associated Antigen together with prompt isolation of carriers and suspected cases affords a valuable means of preventing outbreaks of hepatitis in dialysis units. Regular screening facilities and isolation accommodation should therefore be made available for all dialysis units.

Australia Antigen: Methods of Testing and Significance of the Antigen. Renewed interest in hepatitis has been aroused by the discovery of Australia antigen which can be found in the serum of a proportion of patients during the incubation period and acute phase of the disease. Blood containing the antigen produces hepatitis and antigenaemia in a high proportion of recipients should it be inoculated parenterally. It is also infective orally but this route of transmission is less effective.

Although the antigen consists of particles about the size which has been predicted for the hepatitis virus it is probably not the infective agent since no nucleic acid component has been found. It is still not known whereabouts in the body it is formed, nor has it been detected in urine or faeces. Despite the high concentrations of antigen in the serum, antibody formation does not follow infection and seems to develop only in response to repeated stimuli. The role of the antigen in the pathogenesis of hepatitis remains unknown, and no method of propagating it *in vitro* or of transmitting it to animals has been devised.

In contrast to the lack of progress in the theoretical field much has been learned about the epidemiology of antigen-associated hepatitis during the past year, and there has been considerable improvement in the techniques used for its detection.

There is as yet no satisfactory alternative to antisera from multiply-transfused patients for use in the serological tests but pilot schemes for producing animal sera are now more encouraging. The gel-diffusion test remains the most widely used technique and although it is relatively insensitive its simplicity and economy make it very valuable while antisera are in short supply. The complement-fixation test, which is more sensitive, and immuno-electrophoresis which is very rapid are now more widely used. Because of the characteristic morphology of the particles and the large quantity present in the serum, electron microscopy provides a sensitive way of demonstrating the antigen and since it is independent of the need for an antiserum is particularly effective in investigating false positive reactions due to unwanted antibodies in the detector sera.

The pattern of antigen-positive infection in this country is becoming clearer from the results of surveys of groups of special interest and from testing large numbers of specimens for diagnostic purposes. The carrier rate in healthy young adults who are not blood donors is about 1 : 800 and there is no significant differences between the sexes.

It is evident that hepatitis in children under 15 years of age or in institutional outbreaks is seldom, if ever, associated with Australia antigen. On the other hand, an appreciable proportion of cases of sporadic hepatitis in adults is antigen positive, the proportion ranging between about 10 and 40 per cent in different areas.

" Serum hepatitis "—that is, hepatitis after blood transfusions, tattooing, or narcotic drug abuse—is antigen positive in a little over half the cases. Where rash and joint pains are features of the illness, however, antigen detection is the rule.

From these findings it seems that it will be necessary to repeat many earlier studies of the epidemiological and clinical features of the different types of hepatitis since both " infectious " and " serum " hepatitis diagnosed on classical criteria are heterogeneous groups on the basis of Australia antigen testing.

The apparent increase in the incidence of hepatitis in both the patients and staff of large hospitals has been giving rise to concern. There is little doubt that widespread use of immuno-suppressive drugs and steroids is responsible for the long-term carriage of Australia antigen by virtually asymptomatic patients. When these also require numerous blood transfusions and intensive methods of treatment an explosive situation may arise as in some dialysis and transplant units. It is to be hoped that the routine screening of blood donations by the National Blood Transfusion Service may reduce this problem, as well as preventing many cases of post-transfusion hepatitis but in view of the natural circulation of the agent in the community, control is not likely to prove easy.

In institutions for the mentally defective, hepatitis has long been a problem. Mongol patients, because of their impaired immune mechanisms, are likely to become long-term carriers of Australia antigen and to form a reservoir of infection. The infectivity of this type of hepatitis by contact is not high so it is not likely to cause outbreaks with a high attack rate but its importance as a cause of the characteristic sporadic cases in these hospitals needs to be established.

Long-term carriage of " serum hepatitis " virus by healthy persons has been well demonstrated by the observation that some blood donors repeatedly cause hepatitis in persons receiving their blood. Although in some persons Australia antigen carriage seems to be similarly long lasting, many—perhaps most—carry antigen only for some weeks or months. This gives rise to difficulty in tracing an infective blood donor who may well have become negative before the recipient develops hepatitis. Only long-term follow-up of such individuals will reveal whether the antigen returns after a latent interval.

Despite our lack of insight into its nature, the detection of Australia antigen in different groups of hepatitis patents has already brought about substantial increase in our understanding of the epidemiology of viral hepatitis. Several laboratories in the P.H.L.S. are already undertaking to test specimens for the presence of Australia antigen and surveys are under way of its incidence in hospitals for the mentally defective, in patients after open-heart surgery, and in pregnancy. The very large investigation of the situation in dialysis units has already yielded much useful information. The production of antibody by a group of haemophilic boys is also being studied.

The recent description by Del Prete *et al.* of an antigen which, although not particulate, seems to appear in the serum of some patients from large outbreaks gives some hope that the long-standing stalemate in hepatitis research is giving way to a much more productive period.

Reference

Del Prete, S., Costantino, D., Doglia, M., Graziina, A., Ajudkiewicz, A., Dudley, F. J., Fox, R. A. and Sherlock, S. (1970). *Lancet*, **ii**, 579.

SALMONELLA PANAMA *Infection in a Bacon Factory*. In the spring of 1970 sporadic enteric infections due to *Salmonella panama* began to appear in East Anglia. The proprietor of a village store became infected and her family were found to be carriers. A common food was cooked ham from a bacon factory a few miles away, which feeds half a million people each day. Drain swabs in the factory showed *S. panama*, but examination of the product in the surrounding village stores gave negative results. Swabs from working surfaces in the factory were negative, as were samples from a day's product. It was apparent from the drain swabs that infection was present and a faecal sample from all employees was examined. One man was found to be excreting *S. panama* and he was removed from work. He rapidly reverted to negative and remained so.

No further cases were observed in the district during the next month but, during the summer, Southend and London began to report *S. panama* infections, in which ham supplied from the bacon factory was implicated. Examination of the surfaces in the factory was again carried out and infection was found in the ham-baking section. Examination of the output in cold store showed some of the hams to be infected on the outside. The Ministry agreed to their release for sale, provided that they were sterilised in the original polythene covers at 180°F to a depth of one inch. All hams were withdrawn from retail outlets. A massive cleaning campaign was mounted, and after this surface swabs were negative, but *S. panama* was still isolated from the drains. Two symptomatic cases of *S. panama* infection presented and a further examination of the staff showed 83 asymptomatic excretors, plus one further symptomatic case. The factory was now closed for extensive alterations. After a further negative stool examination, the workers who had originally given negative results were allowed to resume production. Excretors were allowed to return to work after three consecutive negative stools and were examined regularly for three months. Three-quarters of the excretors were treated with sulphamethoxazole and trimethoprim one tablet four times a day for 10 days, but this appeared to confer no advantage over the untreated group.

The origin of the outbreak is unknown. *S. panama* is not a common pathogen of pigs and was absent in over 300 carcasses examined locally. Over 400 samples of pig feed in the region were examined during 1969–70 with negative results, although there were 119 isolations of other salmonella serotypes.

The hygienic standards at the factory conformed to those generally accepted, with an enthusiastic and fully co-operative management. However, similar producers might well benefit from an occasional check on their methods by the facilities of the British Food Manufacturers Federation, to which most of them belong.

The Hygiene and Marketing of Fresh Cream: Report of the P.H.L.S. Working Party. The subject of fresh cream is an interesting one and two facts about it engage attention. One is that regulations governing its production are not so strict as those for milk, the other is that its consumption has not, in the past, been notably associated with outbreaks of food poisoning. With regard to legislation, the 1959 Milk and Dairies (General) Regulations[1] state that it must be produced under hygienic conditions: apart from this, there are no other requirements; a licence is not necessary to produce it, nor does it require to undergo any tests.

Despite the fact that cream has been remarkably free from connection with food poisoning outbreaks, it has attracted the attention of bacteriologists. One of the reasons for this, doubtless, is that conditions under which it is sometimes produced especially in country areas are anything but hygienic; so that although direct evidence of involvement in food poisoning incidents has been scanty the likelihood of its being a vehicle for pathogenic organisms has always been obvious. Cream is an excellent medium for the growth of bacteria, it does not keep well even in the refrigerator and a certain amount of untreated cream is still sold, particularly in country areas.

Food poisoning incidents where cream or cream products have been shown to be implicated, although uncommon, have been recorded; thus cream contaminated with *Staphylococcus aureus* was the cause in three incidents[2, 3, 4] and cream contaminated with *Salmonella typhimurium* in three others.[5, 6, 7] Studies have been made in which the bacteria commonly found in cream have been described,[8] or samples of cream have been examined over a period of time in a certain locality and the question of a possible bacteriological standard for cream, or a test of the hygienic quality examined.[9, 10]

It has been made quite clear from the studies quoted above and from those of others that there is no infallible guide, test, or standard which can be applied to cream to assess the hygienic quality. Moreover, the trade and bacteriologists outside the trade could not agree on the choice of a preferred test from among those commonly used in assessing the hygienic quality of cream, *i.e.* a colony count, a coliform test, or the use of the methylene blue reduction test. Bacteriologists in the Public Health Laboratory Service have tended to favour the use of the methylene blue test; the trade has relied more on colony counts and coliform tests. The fact is that the tests do not agree in the selection of unhygienic samples of cream, e.g. samples with high bacterial counts may not have coliforms present and may fail the methylene blue test; samples containing *E. coli* 1 may pass the methylene blue test and have low total bacterial counts; and samples with low bacterial counts and no coliform bacteria may fail the methylene blue test—a confusing situation.

In 1968 the P.H.L.S. undertook yet another study of cream, on this occasion with the collaboration of the trade, and attempted particularly a more exhaustive assessment of the application of the methylene blue test as a test of hygienic quality. Hitherto studies had tended to be carried out in small confined areas, but in this fresh study, recently published (*J. Hyg., Camb.*, June 1971), no fewer than 37 laboratories participated, thus ensuring a countrywide distribution of samples.

A total of 5184 samples of cream were examined. Bacterial counts in samples reaching the customers were often very high and a good deal of cream was made under unhygienic and otherwise unsatisfactory conditions. Production of cream appeared to fall broadly into two categories. On one hand cream was made by dairies using sound methods, under good supervision, with excellent equipment, in suitable premises with mechanical filling and capping of the containers. In the other category were the small producers where cream was often made in unsuitable conditions and where filling of containers and capping was done by hand: untreated cream, incidentally, was produced almost entirely in this type of dairy. Bacteriologically speaking the cream in the first category was generally better than that produced by the other category of dairy. Thus it may be seen that in the 12 years since the publication of the report[11] of the last P.H.L.S. working party on cream very little improvement in the hygienic quality of cream as sold to the public has taken place. It is interesting to note from the study that 10 per cent of the samples were untreated and that the majority of these were from the North-East of England. *S. aureus* was isolated 54 times from untreated samples but fortunately it does not seem that any food poisoning incidents were associated with any of these infected samples.

The working party draw attention to three points:

(1) *Coliform organisms.* These are often found in heat-treated samples of cream even where these have been handled under reasonably good conditions and it invites the trade to address itself to the reasons why they are present and to remedy the situation if possible.

(2) *The Code of Practice.* The members of the working party think that the best hope for improvement in cream production lies in having a strong Code of Practice and it suggests ways of strengthening the present code as prepared by the Milk and Milk Products Technical Advisory Committee

of the Ministry of Agriculture, Fisheries and Food and the Scottish Home and Health Department.

(3) *Methylene blue test.* The working party have shown by the use of statistical methods that the methylene blue test, in spite of certain anomalies, is likely to be of more use as a screening test than either the colony count or the coliform tests.

But even when making this final recommendation the working party recognise the limitations of the test and emphasises that its only application should be an advisory one, not a penal one. A series of failures on the part of a cream producer to make cream that would give a satisfactory result by the methylene blue test would result, not in court proceedings, fines, or other sanctions but in combined discussions by health authority, bacteriologist, and dairy manager. With good will on the part of all concerned joint discussions by experts in each sphere must surely lead to improvement, ensuring satisfaction to both producer and customer.

REFERENCES

1. Milk and Dairies (General) Regulations, 1959. Statutory Instrument 1959, No. 277, London HMSO.
2. Cockburn, W. C. and Simpson, E. (1954). Food poisoning in England and Wales, 1951–1952. *Mon. Bull. Minist. Hlth Lab. Serv.*, **13**, 12.
3. Cockburn, W. C. and Vernon, E. (1955). Food poisoning in England and Wales, 1954. *Mon. Bull. Minist. Hlth Lab. Serv.*, **14**, 203.
4. Cockburn, W. C. and Vernon, E. (1960). Food poisoning in England and Wales, 1959. *Mon. Bull. Minist. Hlth Lab. Serv.*, **19**, 224.
5. Vernon, E. (1964). Food poisoning in England and Wales, 1963. *Mon. Bull. Minist. Hlth Lab. Serv.*, **23**, 189.
6. Vernon, E. (1967). Food poisoning in England and Wales, 1966. *Mon. Bull. Minist. Hlth Lab. Serv.*, **26**, 235.
7. Vernon, E. (1969). Food poisoning in England and Wales, 1968. *Publ. Hlth, Lond.*, **83**, 205.
8. Jenkins, H. R. and Henderson, R. J. (1969). The source of bacteria in fresh cream, and the methylene blue reduction test as a guide to hygienic quality. *J. Hyg., Camb.*, **67**, 401.
9. Colenso, R., Court, G. and Henderson, R. J. (1966). Fresh cream in Worcestershire: A bacteriological study. *Mon. Bull. Minist. Hlth Lab. Serv.*, **25**, 153.
10. Hutchinson, J. G. P., Barrow, G. I., Henderson, R. J. and Wright, A. E. (1968). The bacteriological quality of dairy cream. *Lancet*, **ii**, 99.
11. Report (1958). The bacteriological examination and grading of fresh cream. Report of a working party of the Public Health Laboratory Service. *Mon. Bull. Minist. Hlth Lab. Serv.*, **17**, 77.

Imported Infections. The returning holiday-maker or immigrant may bring with him into the country more than is commonly realised. Infectious diseases are not declarable at the Customs desk and the traveller is usually not aware that he is carrying such contraband. The existing international sanitary regulations were framed in 1946 and accepted in 1951.[1] These regulations were still mainly directed towards " boat and train " modes of transport. Since they were devised the top cruising speed of aircraft has increased fourfold, the maximum payload of passengers per aeroplane has increased tenfold, and the number of passengers carried each year on scheduled international flights has increased from less than four million to an estimated 100 million in 1975.[2] This does not include the enormous increase in holiday charter flights to such resorts as Majorca, where, during 1969–70, a new hotel was erected for every day of the year.[3] Thus a man may drink a glass of contaminated water and fly back to Britain and develop typhoid fever at any time up to six weeks after his return. Because of this situation the responsibility for recognising imported disease has passed from the competence of " The Authorities ", e.g. Port Health and Immigration Officials, Medical Officers of Health, and others, to the jurisdiction of the general practitioner.[4] The latter now finds himself with three duties towards his intermittently airborne patients: (i) to protect them with the appropriate vaccines early enough for immunity to have developed before possible contact (the vaccines associated with international certification are not always the most useful to the patient); (ii) to recommend suppressive drugs and to advise them on behaviour abroad, e.g. not to eat unwashed salad in India or to bathe in unconcreted pools in Africa;[5] and (iii) to remind them on their return, to be aware of the significance of their visit abroad and to consider the possibility of an exotic infection if they develop rashes, fevers, or gastro-intestinal disorders soon after their return.

Although there may be some overlap in the kinds of infections exhibited by holiday makers and immigrants, the two groups are really quite separate, exemplifying the effects of short and long periods of exposure respectively. The short-stay visitor will develop almost exclusively such diseases as are easily transmissible, such as enteric fever, malaria or smallpox. On the other hand, the immigrant, representing a longer sojourn in an endemic area, will more often present with a disease of low infectivity, such as leprosy, or, owing to frequent re-infection, in an advanced stage of an illness caused by a parasite that might give rise to only minimal disease through a single incident of infection; an example of this is the severe hepatic fibrosis, ascites, and enlarged spleen due to constant re-infection with *Schistosoma mansoni.* In many cases of exotic infection " . . . it is easy to be misled if reliance is placed on clinical diagnosis."[6] Diagnosis must be reached by taking a geographical history and using this as an indication of what sort of specimens to send to the laboratory, preferably after consulting the pathologist.

Although it carries almost no public health risk, malaria is the most important imported disease from the patient's point of view and, as the holiday areas broaden from the Mediterranean towards Africa and the Middle East[2] it will become more important. In a series of 2000 cases seen in this country between 1954 and 1969, there were 58 deaths.[7] Every death was caused by *Plasmodium falciparum* and many patients died because the examination was not made until too late—sometimes at *post mortem.* In all the 2000 cases quoted not one patient had continued taking prophylactic drugs for a month after returning to this country as is advised. Malaria must also be considered in patients developing post-transfusion reactions, especially when there is a daily elevation of temperature for four or five days.[8] Even accidental inoculation of infective blood may give rise to this disease.[9]

Smallpox and enteric fever are the most important imported diseases of public health significance. It is generally accepted that a patient suffering from diarrhoea within a week or so of returning from abroad is suffering infection due to an organism of the salmonella or shigella groups until proved otherwise, but it is still not generally realised that enteric fever does not often present with acute diarrhoea. Once such a case is bacteriologically confirmed one must remember that others may have been infected from the same source and other persons on the same flight or staying at the same resort must be investigated. Again, any case of chickenpox or rash with pneumonia occurring in a recent arrival from India, Pakistan, or any area where smallpox is endemic, should be subjected to virological investigation and the scrutiny of an expert before the diagnosis of smallpox is discarded.

Of the classic epidemic diseases, plague and cholera are still common in the underdeveloped and conflicting nations. One holiday maker has already been shown to be excreting the cholera vibrio after returning to this country[10] and it would be surprising if he were the only one. In the same way an odd case of plague might be imported. Where there is clean drinking water, efficient sewage disposal, and a rat-free environment, these diseases are not likely to constitute public health hazards, although a breakdown in public services and the emergence of a resistant " super-rat " might alter this conclusion.

From time to time " medical curiosities " need investigation; indolent ulcers of the face and arms may be due to cutaneous leishmaniasis[11] or saprophytic acid-fast bacilli; chronic non-irritative skin rashes or nodules must be examined for leprosy bacilli; the blood, lymph-gland fluid, and cerebrospinal fluid must be searched for trypanosomes in travellers from Africa with annular erythematous rashes, encephalitis, or psychopathic tendencies.[12] In addition the helminth ova, the heraldic devices of the parasitologist, must be searched for in the stools, using concentration methods when necessary.[13]

In the last instance it is necessary to remember the exotic disease so often on one's own doorstep—amoebiasis. This condition may be found in patients returning from temperate countries, such as the U.S.A. and even in some who have never left this country. All cases of chronic diarrhoea, especially those labelled " ulcerative colitis ", should be carefully screened to exclude amoebic infection before surgery is considered. This should include the examination of fresh stools for parasites, mucosal biopsy, and a serological test, such as the very convenient latex agglutination test.[14] There have been many instances when patients have been snatched from the surgeons at the last minute with their colons still intact;[15] other patients have been less fortunate.[16].

References

1. Dorolle, P. (1968). *Brit. med. J.*, **2**, 789.
2. Bruce-Chwatt, L. S. (1970). *Trans. R. Soc. trop. Med. Hyg.*, **64**, No. 2, 201.
3. B.B.C. Television 30th October, 1970. Europe this Week.
4. Maegraith, B. G. (1970). *Trans. R. Soc. trop. Med. Hyg.*, **64**, No. 2, 200.
5. Maegraith, B. G. (1968) in *Symposium on the early detection of imported and endemic disease. J. R. Coll. gen. Practit.*, **16**, Suppl. No. 2, 7.
6. Maegraith, B. G. (1968). *ibid*, Suppl. No. 2, 3.
7. Shute, P. G. and Maryon, M. (1969). *Brit. med. J.*, **2**, 781.
8. Dike, Angela E. (1970). *Lancet*, **2**, 72.
9. Burne, J. C. (1970). *Lancet*, **2**, 936.
10. Communicable Disease Report 70/37, Public Health Laboratory Service, September 1970.
11. *ibid* 69/53, December 1969.
12. Walters, J. (1970). *Trans. R. Soc. trop. Med. Hyg.*, **64**, No. 2, 220.
13. Allen, A. V. H. and Ridley, D. S. (1970). *J. clin. Path.*, **23**, 6, 545.
14. Morris, M. N., Powell, S. J. and Elsdon-Drew, R. (1970). *Lancet*, **1**, 1362.
15. McAllister, T. A. (1962). *Brit. med. J.*, **1**, 362.
16. Wright, R. (1966). *Brit. med. J.*, **1**, 957.

EB Virus and Infectious Mononucleosis. The clinical, haematological, and serological manifestations of infectious mononucleosis are well documented, but there is little knowledge of even the most basic epidemiological aspects of the disease. Despite numerous investigations, uncertainty persists about its incubation period, its mode of transmission, its occupational and seasonal prevalance, and its curious predilection for adolescents and young adults.

Recognition of the EB virus and its association with infectious mononucleosis has opened the way to advances in epidemiology. In 1969 a working group from the Public Health Laboratory Service and the Association of University Health Physicians began to examine the manifestations of a first infection with EB virus in young people, with special reference to infectious mononucleosis. Cytomegalovirus is believed to be an occasional cause of infectious mononucleosis and studies of this virus therefore also included.

The investigation is being made in the Universities of Nottingham, Keele, Leicester and Birmingham, and colleges in Bedford and Gloucester. Since October 1969, students on entry were asked to volunteer. Those taking part have had a preliminary serum sample tested for the presence of antibody to EB virus and to cytomegalovirus. Students without antibody to either of these viruses are recalled towards the end of each academic year and retested to determine whether they have been infected. The medical records of students whose samples show that since entry they have been infected with EB virus are examined and compared with those of a control group who have remained uninfected.

It is planned to recall students at intervals during the three-year period at university. By this means it will be possible to determine what manifestations are produced by a first infection with EB virus and cytomegalovirus in young adults. In students in whom infection with the virus is followed by frank manifestations of infectious mononucleosis, the association between infection and the haematological and clinical criteria and the Paul Bunnell test will be of special interest.

One aspect of infectious mononucleosis about which little is known is the relationship of Paul Bunnell-negative to Paul Bunnell-positive cases. There is uncertainty, for example, whether Paul Bunnel-negative cases share a common origin with those which are Paul Bunnell-positive. The presence of the initial sera taken on entry, which can be tested for a variety of viruses, will enable some aspects of this problem to be investigated.

When the participants finally leave university, it is planned by inserting a record in the N.H.S. envelope to initiate a follow-up of the long-term effects of EB virus infection.

The above aspects of the survey are confined to students entering the universities from 1969 onwards who volunteer to take part in the survey. However, all patients with infectious mononucleosis in the universities and colleges concerned (whether or not they are included in the initial survey) are being fully investigated and the presence of antibody to EB virus is being related to clinical and haematological manifestations and to the results of the Paul Bunnell test. The investigation thus embodies a comprehensive survey among university students which will enable the real incidence of infectious mononucleosis to be adequately determined.

About three thousand students entering universities in October 1969 and 1970 have agreed to take part. The antibody titrations of these initial sera have shown that about two-thirds of these students have already been infected with EB virus, and one-third with cytomegalovirus, before entering university. A preliminary report of the investigation will be published in 1971.

In association with the university survey a similar pilot study to determine the manifestations of EB virus infection in young children has been begun in day nurseries in Oxford and Wolverhampton. In this study children known to be without antibody to EB virus are being retested after an interval to study the association between infection and the development of symptoms.

Cholera 1970. During 1970, cases of cholera were reported from countries in the Middle East and Africa which had not been infected areas for several decades. These cases were due to *Vibrio cholerae* of the El Tor biotype and are recorded clinically as being mainly of the severe gastro-enteritis syndrome rather than the classical disease seen in the endemic areas of the Far East.

In Europe, strains were also isolated in Czechoslovakia, France and Britain, but in general, the patients involved were infected outside these countries.

The British patient, a male aged 57, had had severe diarrhoea and vomiting during a holiday visit to Tunisia, and on his return to Britain some days later, though he had by then no diarrhoea, a faecal specimen yielded *Vibrio cholerae* of the El Tor biotype and Ogawa subserotype. Though well, he continued to excrete the organisms for about 20 days from the first isolation. Strains were not isolated from his immediate contacts, nor were other cases found in Britain.

It is the gastro-enteritis syndrome due to cholera vibrios which is most likely to be seen in the non-endemic areas and to which clinicians and bacteriologists must be alert and equipped for its rapid identification.[1] Since the P.H.L.S. Memorandum[2] a new selective medium TCBS (a contraction for thiosulphate, citrate, bile salt, sucrose, first described in Japan), has been widely tested in the field. It is now available in dehydrated form from several commercial sources and is easy to prepare when required in an emergency in the non-endemic areas.

On TCBS medium intestinal vibrios (*i.e.* the classical *Vibrio cholerae*, the El Tor biotype, and the non-cholera vibrios, which excludes the so-called *Vibrio fetus* now more correctly classified in the *Campylobacter* genus) produce colonies 2–3 mm. in diameter, flattish, translucent and yellow.

Salmonellae and shigellae do not usually grow on TCBS so specific selective media must be used for these groups in addition. Certain strains of other intestinal organisms occasionally grow on TCBS but they are colonially distinct and easily distinguishable with a little experience.

Apart from direct plating on TCBS medium, enrichment in alkaline peptone medium and subsequent subculture after four to six hours' incubation on to TCBS gives a high rate of isolation of vibrios.

Because of the public health repercussions after the recognition of cholera cases, bacteriological identification must be accurately and responsibly done.

REFERENCES

1. *Brit. med. J.*, 1967, **i**, 496.
2. *Mon. Bull. Minist. Hlth Lab. Serv.*, 1966, **25**, 58.

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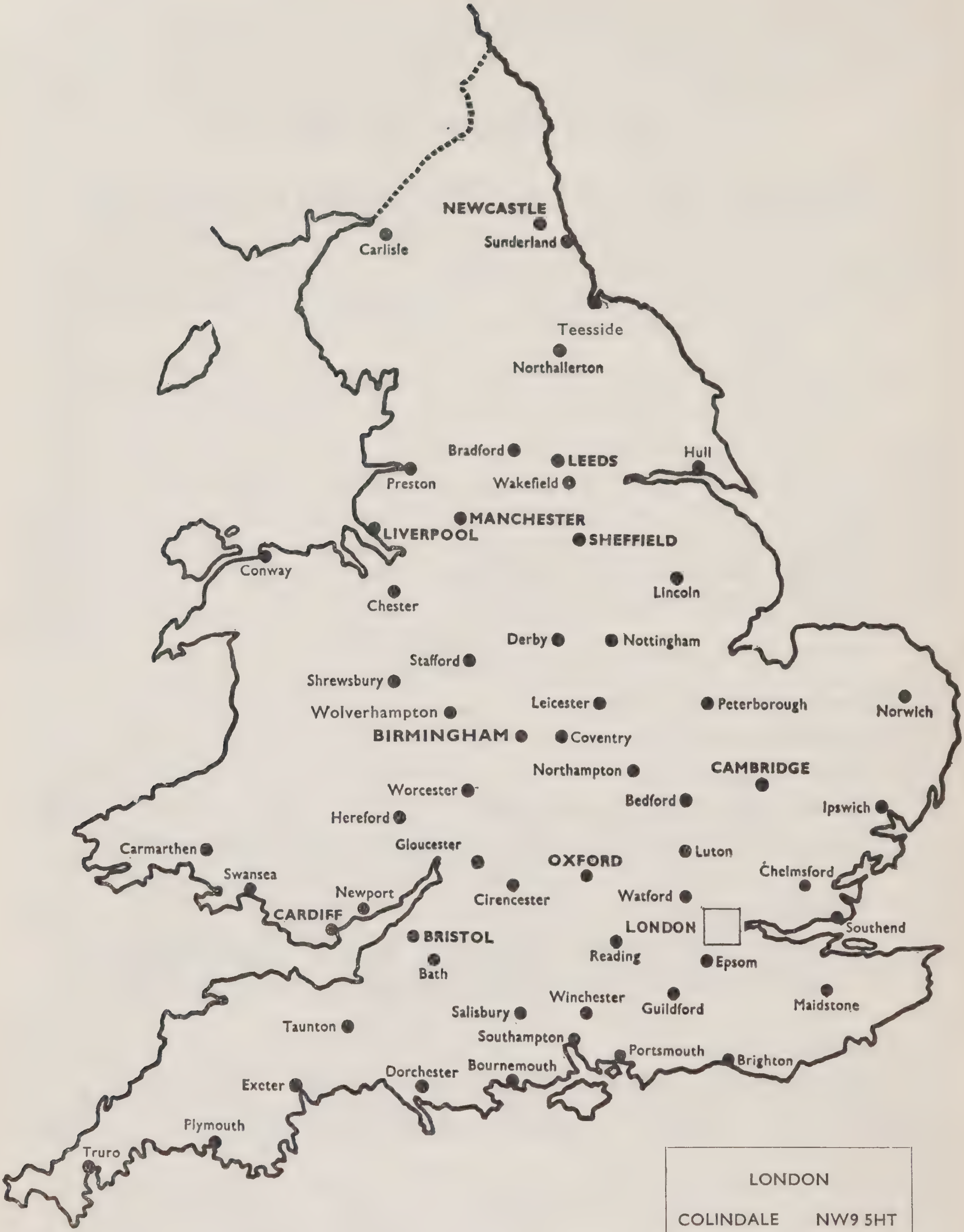

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COLINDALE	NW9 5HT
Central Middlesex Hospital	NW10 7NS
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DIRECTORY OF THE SERVICE

HEADQUARTERS ADMINISTRATIVE OFFICE

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Tel.: 01-636 2223

Sir James Howie, LL.D., M.D., F.R.C.P., F.R.C.Path. (*Director of the Service*)
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CENTRAL PUBLIC HEALTH LABORATORY

Colindale Avenue, London, NW9 5HT
Tel.: 01-205 7041
Telegraphic Address: Defender London NW9 5HT

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*F. A. J. Bridgwater, M.B., M.R.C.Path., Dip.Bact. (*Deputy Director*)
P.D. Littlejohns, F.I.M.L.T. (*Head Technician*)
D. McGhie, M.B.
G. Tebbutt, B.Sc.

BRISTOL:

Public Health Laboratory, Myrtle Road, Kingsdown, Bristol, BS2 8EL
Tel.: Bristol (STD 0272) 21326

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Miss Suzanne K. R. Clarke, M.D., M.R.C.Path. (*Deputy Director*)
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R. Shannon, F.I.M.L.T. (*Head Technician*)

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Tel.: Cambridge (STD 0223) 55526 and 57573

G. R. E. Naylor, M.D., F.R.C.P., M.R.C.Path. (*Director*)
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CARDIFF:

Public Health Laboratory, University Hospital of Wales, Heath Park, Cardiff, CF4 4XW
Tel.: Cardiff (STD 0222) 755944

C. H. L. Howells, B.Sc., M.D., F.R.C.Path. (*Director*)
A. D. Evans, M.B., B.Sc., M.R.C.Path., Dip.Bact.
R. W. S. Harvey, B.Sc., M.D., F.R.C.Path., Dip.Bact. (*Deputy Director*)
Miss Julia A. Munro (Mrs. Price), M.B,. M.R.C.S.
T. H. Price, F.I.M.L.T. (*Head Technician*)

---

*Consultant Microbiologist employed by the Birmingham Regional Hospital Board (*see page* 44)

LEEDS:

Public Health Laboratory, Bridle Path, York Road, Leeds, LS15 7TR
Tel.: Leeds (STD 0532) 645011

- G. B. Ludlam, M.D., F.R.C.Path., D.T.M. & H., D.L.O. (*Director*)
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- K. Mohamed, B.Sc.

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Public Health Laboratory, 126 Mount Pleasant, Liverpool, L3 5SU
Tel.: 051–709 3636

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- Miss Elizabeth C. Armstrong, M.D., M.R.C.Path., Dip.Bact. (*Deputy Director*)
- C. I. Ashton, B.Sc.
- Miss Margery B. Baillie, M.Sc., Ph.D.
- Mrs. Helen T. Green, M.D.
- R. Harper, F.I.M.L.T. (*Head Technician*)
- Miss Ragaa M. Lasheen (Mrs. Farag), M.D., Dip.Bact.
- C. Roberts, M.D.
- Mrs. Dawn Stancliffe, B.Sc.
- G. B. B. White, M.R.C.S., M.R.C.Path., Dip.Bact.

MANCHESTER:

Public Health Laboratory, Withington Hospital, Manchester, M20 8LR
Tel.: 061-445 2416

- J. O'H. Tobin, B.M., M.R.C.Path., Dip.Bact. (*Director*)
- J. D. Abbott, M.D., M.R.C. Path. Dip.Bact. (*Deputy Director*)
- J. E. Cradock-Watson, B.M.
- W. M. Darling, M.D.
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- Miss Margaret E. Macaulay, M.B., Dip. Bact.
- Mrs. Helen McDonald, M.B. (*part-time*)
- L. E. Simmons, F.I.M.L.T. (*Head Technician*)
- Miss Joan M. Watkinson, B.Sc.

NEWCASTLE:

Public Health Laboratory, Institute of Pathology, General Hospital, Westgate Road, Newcastle upon Tyne, NE4 6BE
Tel.: Newcastle (STD 0632) 38811, Ext. 297

- J. H. Hale, O.B.E., M.D., F.R.C.Path., M.R.C.P. (*Director*)
- A. A. Codd, M.B., Dip.Bact.
- J. A. Hall, F.I.M.L.T. (*Head Technician*)
- G. E. Rich, M.B., Dip.Bact.
- J. B. Selkon, M.B., M.R.C.Path., D.C.P. (*Deputy Director*)

OXFORD:

Public Health Laboratory, Radcliffe Infirmary, Oxford, OX2 6AH
Tel.: Oxford (STD 0865) 49231/2

W. H. H. Jebb, M.D., F.R.C.Path. (*Director to 30th September*, 1971)
H. H. Johnston, D.Phil. (*Deputy Director*)
A. M. R. Mackenzie, B.A., B.M., B.Sc., Dip.Bact.
A. Peacock (*Head Technician*)
M. Severn, M.B., M.R.C.Path.
A. H. Tomlinson, M.A., D.Phil.

SHEFFIELD:

Public Health Laboratory, Northern General Hospital, Herries Road, Sheffield, S5 7AU
Tel.: Sheffield (STD 0742) 387253

E. H. Gillespie, M.B., F.R.C.Path. (*Director*)
A. E. Jephcott, M.A., M.B., M.R.C.Path., Dip.Bact.
W. A. Sutcliffe, F.I.M.L.T. (*Head Technician*).
A. B. White, M.B., Dip.Bact.
Miss Margaret A. M. Wilson, M.B., M.R.C.Path., Dp.Bact. (*Deputy Director*)

AREA LABORATORIES

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Public Health Laboratory, Royal United Hospital, Combe Park, Bath, BA1 3NG
Tel.: Bath (STD 0224) 24624

P. G. Mann, M.D., M.R.C.Path., Dip.Bact. (*Director*)
Mrs. Monica Lloyd, M.B. (*part-time*)
D. W. Marshall, F.I.M.L.T. (*Head Technician*)

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Public Health Laboratory,
16–18 Edmund Street, Bradford BD5 0BH
Tel.: Bradford (STD 0274) 24314

H. G. M. Smith, M.B., Ph.D., Dip.Bact. (*Director*)
M. Peel, F.I.M.L.T. (*Head Technician*)

BEDFORD:

Public Health Laboratory, General Hospital, Kimbolton Road, Bedford
Tel.: Bedford (STD 0234) 51707

W. F. Lane, M.B., M.Sc., F.R.C.Path., D.P.H. (*Director*)
J. Marshall, F.I.M.L.T. (*Senior Technical Officer*)

BRIGHTON:

Public Health Laboratory, Royal Sussex County Hospital, Brighton, BN2 5BE
Tel.: Brighton (STD 0273) 63506

J. E. Jameson, M.R.C.S. (*Director*)
N. W. Emberley, A.I.M.L.T. (*Head Technician*)

CARLISLE:

Public Health Laboratory, Cumberland Infirmary, Carlisle
Tel.: Carlisle (STD 0228) 23654 or 23444
D. G. Davies, M.D., F.R.C.Path. Dip.Bact. (*Director*)
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CARMARTHEN:

Public Health Laboratory, West Wales General Hospital, Glangwili, Carmarthen
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CHELMSFORD:

Public Health Laboratory, Chelmsford and Essex Hospital, New London Road, Chelmsford
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R. Pilsworth, M.D., Dip.Bact. (*Director*)
P. Maybury, F.I.M.L.T. (*Head Technician*)

CHESTER:

Public Health Laboratory, Chester City Hospital, Hoole Lane, Chester, CH2 3EG
Tel.: Chester (STD 0244) 21417
Miss Pauline M. Poole, M.D., M.R.C.Path., B.A.O., Dip.Bact. (*Director*)
D. Breckon, F.I.M.L.T. (*Head Technician*)

CONWAY:

Public Health Laboratory, "Bryn Hyfryd", Conway
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P. W. W. Griffiths, M.B., M.R.C.Path., Dip.Bact. (*Deputy Director*)
K. L. Thomas F.I.M.L.T. (*Head Technician*)

COVENTRY:

Public Health Laboratory, Coventry and Warwickshire Hospital, Stoney Stanton Road, Coventry, CV1 4FH
Tel.: Coventry (STD 0203) 25937 and 24055
J. E. M. Whitehead, M.A., M.B., F.R.C.Path., Dip.Bact. (*Director*)
M. W. Scruton, F.I.M.L.T. (*Head Technician*)
Miss Irene Thangkhiew, M.Sc., M.B., Dip. Bact.

DERBY:

Public Health Laboratory, 121a Osmaston Road, Derby, DE1 2GB
Tel.: Derby (STD 0332) 41513
B. W. Barton, M.B., M.R.C.Path., Dip.Bact. (*Director*)
Mrs. Evelyn M. Finnie, M.D., M.Sc.
G. F. Johnstone, F.I.M.L.T. (*Head Technician*)

DORCHESTER:

Public Health Laboratory, Glyde Path Road, Dorchester
Tel.: Dorchester (STD 0305) 4478
G. H. Tee, F.R.C.Path., M.R.C.S., Ph.D. (*Director*)
E. F. C. Coetzee, F.I.M.L.T. (*Head Technician*)

EPSOM:

Public Health Laboratory, West Park Hospital, Epsom
Tel.: Epsom (01-39) 26633

- D. R. Gamble, M.B., M.R.C.Path., Dip.Bact. (*Director*)
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- N. J. Mitchell, M.B., M.R.C.S., Dip.Bact.
- Miss Elizabeth I. Tanner, M.B., M.R.C.Path., Dip.Bact. (*Deputy Director*)

EXETER:

Public Health Laboratory, Church Lane, Heavitree, Exeter, EX2 5AD
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- D. L. Miller, M.D., D.P.H.
- W. J. Ryan, M.B., D.P.H., Dip.Bact.

GLOUCESTER:

Public Health Laboratory, Gloucestershire Royal Hospital, Southgate Street, Gloucester
Tel.: Gloucester (STD 0452) 21021

- A. E. Wright, T.D., M.D., M.R.C.Path., D.P.H., Dip.Bact. (*Director*)
- G. Spence, F.I.M.L.T. (*Head Technician*)

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- Miss Joan R. Davies, M.D., Dip.Bact. (*Director from 1st December, 1971*)
- C. Dulake, M.B., M.R.C.Path., Dip.Bact. (*Deputy Director*)
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Public Health Laboratory, County Hospital, Hereford
Tel.: Hereford (STD 0432) 4696

- D. R. Christie, M.B., Dip.Bact. (*Director*)
- C. R. Harris, F.I.M.L.T. (*Head Technician*)

HULL:

Public Health Laboratory, Hull Royal Infirmary, Anlaby Road, Hull
Tel.: Hull (STD 0482) 23046

- J. H. McCoy, M.B., D.P.H. (*Director*)
- G. E. Spain, F.I.M.L.T. (*Head Technician*)

IPSWICH:

Public Health Laboratory, Woodbridge Road East, Ipswich, IP4 5PE
Tel.: Ipswich (STD 0473) 77261/2

- P. K. Fraser, M.D., F.R.C.Path., M.R.C.P. (*Director*)
- A. H. Durrant, F.I.M.L.T. (*Head Technician*)

LEICESTER:

Public Health Laboratory, Groby Road Hospital, Leicester, LE3 9QE
Tel.: Leicester (STD 0533) 872283

- N. S. Mair, M.B., F.R.C.Path., D.C.H., D.P.H., Dip.Bact. (*Director*)
- E. Fox, F.I.M.L.T. (*Head Technician*)
- Mrs. Hélène J. Mair, M.D., M.R.C.Path., Dip.Bact. (*part-time*)

LINCOLN:

Public Health Laboratory, St. Anne's
Road, Lincoln
Tel.: Lincoln (STD 0522) 28607

J. M. Croll, M.B., F.R.C.Path., D.P.H. (*Director to 5th September*, 1971)
J. G. Wallace, B.M., M.R.C.Path., D.C.P., Dip.Bact. (*Director from 6th September*, 1971)
R. Clark, F.I.M.L.T. (*Head Technician*)

LONDON:

CENTRAL MIDDLESEX HOSPITAL

Public Health Laboratory, Central
Middlesex Hospital, Acton Lane,
Park Royal, London, NW10 7NS
Tel.: 01-965 5733

Neasden Hospital, Brentfield Road,
London, N.W.10
Tel.: Willesden (STD 01-459) 1422

C. E. D. Taylor, M.A. M.D., M.R.C.Path., Dip.Bact. (*Director*)
Mrs. Beryl J. Challand, B.Sc.
G. V. Heimer, F.I.M.L.T. (*Technical Officer*)
Miss Susan M. Jordon, B.Sc.
*D. A. McSwiggan, L.R.C.P.I., M.R.C.Path., D.T.M. & H., Dip.Bact. (*Deputy Director*)
Miss Stella Parrack (Mrs. Goldberg), M.B., D.R.C.O.G. (*part-time*)
A. F. M. S. Rahman, M.B., L.M.S.S.A., M.R.C.Path., D.P.H., D.T.M.&H., Dip.Bact.

COUNTY HALL, S.E.1

Bacteriological Laboratory (P.H.L.S.),
Room 617, County Hall, Westminster Bridge, London, S.E.1
Tel.: 01-928 3467

Miss Joan R. Davies, M.D., Dip.Bact. (*Director to 30th November*, 1971)
C. H. Collins, M.I.Biol., F.I.M.L.T. (*Senior Technical Officer*)
Mrs. Anne H. C. Uttley, M.B., Ph.D., M.R.C.Path., Dip. Bact.

LONDON (*continued*):

TOOTING, S.W.17

Public Health Laboratory, St. George's
Hospital, Tooting Grove, London,
S.W.17
Tel.: 01-672 1255

D. G. Fleck, M.D., M.R.C.Path., Dip.Bact. (*Director*)
B. S. Chessum, F.I.M.L.T. (*Head Technician*)
Miss Helen G. Ross, M.B., D.T.M. & H., Dip.Bact.

WHIPPS CROSS, E.11

Public Health Laboratory, Whipps
Cross Hospital, Whipps Cross Road,
London, E11 1NR
Tel.: 01-539 5223

B. T. Thom, M.B., M.R.C.Path., Dip.Bact. (*Director*)
J. N. Pilfold, F.I.M.L.T. (*Head Technician*)

LUTON:

Public Health Laboratory, Luton and
Dunstable Hospital, Lewsey Road,
Luton, LU4 0DZ
Tel.: Luton (STD 0582) 52007

A. T. Willis, M.D., Ph.D., D.Sc., M.R.A.C.P., M.R.C.Path., M.C.P.A. (*Director*)
Mrs. Catherine L. Bullen, M.R.C.V.S.
R. Burt, F.I.M.L.T. (*Head Technician*)
R. Wiseman, M.B., M.R.C.Path., Dip.Bact.
Miss Susan E. J. Young, B.A., M.B., M.R.C.P., B.A.O., D.C.H.

---

*Consultant Microbiologist employed by the North-West Metropolitan Regional Hospital Board (*see page* 40)

MAIDSTONE:

Public Health Laboratory, Preston Hall, British Legion Village, Maidstone
Tel.: Maidstone (STD 0622) 77155

A. L. Furniss, M.D., Dip.Bact. (*Director*)
*T. J. Donovan, F.I.M.L.T. (*Head Technician*)
Miss Ruth C. J. James (Mrs. Barkhan), M.B., M.R.C.Path., Dip.Bact. (*part-time*)
Miss Evelyn J. Parr, F.I.M.L.T. (*Acting Head Technician*)

MIDDLESBROUGH:

Middlesbrough is now part of the County Borough of Teesside, and in future will be listed as TEESSIDE

NEWPORT (Mon.):

Public Health Laboratory, Clytha Square, Newport, NPT 2TZ
Tel.: Newport (STD 0633) 63248

R. D. Gray, M.D., F.R.C.Path., D.P.H. (*Director*)
G. H. Lowe, F.I.M.L.T. (*Technical Officer:* holder of collection of type cultures of *Trichomonads*)

NORTHALLERTON:

Public Health Laboratory, The Friarage Hospital, Northallerton
Tel.: Northallerton (STD 0609) 2088

J. G. Wallace, B.M., M.R.C.Path., D.C.P., Dp.Bact. (*Director to 5th September*, 1971)
K. Spence, F.I.M.L.T. (*Head Technician*)

NORTHAMPTON:

Public Health Laboratory, General Hospital, Northampton, NN1 5BD
Tel.: Northampton (STD 0604) 34347

L. Hoyle, M.B. (*Director*)
F. N. Cannon, F.I.M.L.T. (*Head Technician*)

NORWICH:

Public Health Laboratory, Bowthorpe Road, Norwich, NOR 22H
Tel.: Norwich (STD 0603) 28145

Miss Lynette M. Dowsett, M.D., F.R.C.Path. (*Director*)
Miss Margaret Fitt, B.Sc.
T. D. F. Money, M.A., M.B., D.Obst. R.C.O.G. (*part-time*)
C. W. Sivell, F.I.M.L.T. (*Head Technician*)

NOTTINGHAM:

Public Health Laboratory, City and Sherwood Hospitals, Hucknall Road, Nottingham, NG5 1PH
Tel.: Nottingham (STD 0602) 65065

E. R. Mitchell, M.B., M.R.C.Path., Dip.Bact. (*Director*)
P. A. Greaves, F.I.M.L.T. (*Head Technician*)
M. J. Lewis, M.D., Dip.Bact.

PETERBOROUGH:

Public Health Laboratory, Peterborough District Hospital, Peterborough, PE3 6DA
Tel.: Peterborough (STD 0733) 67451, Ext. 410

E. J. G. Glencross, M.B., M.R.C.Path., Dip.Bact. (*Director*)
M. W. D. Buxton, F.I.M.L.T. (*Head Technician*)

---

* Seconded to the Jinnah Postgraduate Medical Centre, Karachi, Pakistan

PLYMOUTH:

Public Health Laboratory, Plymouth General Hospital, Greenbank Road, Plymouth
Tel.: Plymouth (STD 0752) 63997

P. D. Meers, M.D., M.R.C.Path., Dip.Bact. (*Director*)
Miss Gillian M. Churcher, M.B., M.R.C.Path., Dip.Bact.
G. H. Sandys, F.I.M.L.T., (*Head Technician*)

POOLE:

Public Health Laboratory, Poole General Hospital, Poole, Dorset, BH15 2JB
Tel: Poole (STD 02013) 5771

G. J. G. King, M.B., F.R.C.Path., Dip.Bact. (*Director to* 31*st August*, 1971)
W.L. Hooper, B.Sc., M.B., M.R.C.Path., Dip.Bact. (*Acting Director from* 1*st September*, 1971)
M. S. Jones, F.I.M.L.T. (*Head Technician*)

PORTSMOUTH:

Public Health Laboratory, St. Mary's General Hospital, East Wing, Milton Road, Portsmouth, PO3 6AQ
Tel.: Portsmouth (STD 0705) 22331

D. J. H. Payne, M.B., F.R.C.Path., Dip.Bact. (*Director*)
C. S. Goodwin, M.D., Dip.Bact.
J. V. T. Gostling, M.A., M.B., F.R.C.Path., M.R.C.S. (*Deputy Director*)
A. D. Pearson, B.A., B.M.
R. A. Quaife, F.I.M.L.T. (*Head Technician*)
Mrs. Susan T. Scarfe, B.Sc.
Miss Janet E. M. Strangeways, M.B., M.R.C.S.

PRESTON:

Public Health Laboratory, Royal Infirmary, Meadow Street, Preston, PR1 6PS
Tel.: Preston (STD 0772) 53975

L. Robertson, M.A., B.M., F.R.C.Path., Dip.Bact. (*Director*)
H. C. Dawkins, F.I.M.L.T. (*Head Technician*)
I. D. Farrell, B.Sc., Ph.D.
**D. N. Hutchinson, M.D., Dip.Bact. (*Deputy Director*)

READING:

Public Health Laboratory, Royal Berkshire Hospital, Reading, RG1 5AN
Tel.: Reading (STD 0734) 52957

J. V. Dadswell, M.B., M.R.C.Path. (*Director*)
R. A. Everard, F.I.M.L.T. (*Head Technician*)

SALISBURY:

Public Health Laboratory, Odstock Hospital, Salisbury
Tel.: Salisbury (STD 0722) 6020

P. J. Wormald, M.D., F.R.C.Path. (*Director*)
A. S. Greasby, F.I.M.L.T. (*Head Technician*)

SHREWSBURY:

Public Health Laboratory, New Royal Salop Infirmary, Mytton Oak Road, Shrewsbury, SY3 8XH
Tel.: Shrewsbury (STD 0743) 57101

A. C. Jones, M.B., M.R.C.Path. (*Director*).
P. H. Everall, F.I.M.L.T. (*Technical Officer*)
C. A. Morris, B.Sc., M.D., Dip. Bact.

---

*Consultant Microbiologist employed by the Wessex Regional Hospital Board (*see page* 44)
*Consultant Microbiologist employed by the Manchester Regional Hospital Board (*see page* 44)

SOUTHAMPTON:

Public Health Laboratory, General Hospital, Tremona Road, Southampton, SO9 4XY
Tel.: Southampton (STD 0703) 76177
J. M. Graham, M.B., M.R.C.Path., Dip.Bact. (*Director*)
W. G. Suckling, A.I.M.L.T. (*Head Technician*)

SOUTHEND:

Public Health Laboratory, Southend General Hospital, Prittlewell Chase, Westcliff-on-Sea, SS0 0RY
Tel.: Southend (STD 0702) 48911
J. A. Rycroft, M.B., M.R.C.Path., Dip.Bact. (*Director*)
A. F. Barnard, F.I.M.L.T. (*Head Technician*)

STAFFORD:

Public Health Laboratory, Martin Street, Stafford
Tel.: Stafford (STD 0785) 54377
P. Cavanagh, M.A., M.D., B.A.O., Dip.Bact. (*Director*)
L. J. Haughton, F.I.M.L.T. (*Head Technician*)

SUNDERLAND:

Public Health Laboratory, Havelock Hospital, Hylton Road, Sunderland, SR4 8AE
Tel.: Sunderland (STD 0783) 56256
P. B. Crone, M.D., Dip.Bact. (*Director*)
J. B. Patton, F.I.M.L.T. (*Head Technician*)

SWANSEA:

Public Health Laboratory, Cockett Road, Swansea, SA2 0FA
Tel.: Swansea (STD 0792) 24041
W. Kwantes, M.A., M.B., F.R.C.Path., Dip.Bact. (*Director*)
R. Brooks, F.I.M.L.T. (*Head Technician*)
Mrs. Barbara R. Ivey, M.B. (*part-time*)

TAUNTON:

Public Health Laboratory, Taunton and Somerset Hospital, Musgrove Park Branch, Taunton
Tel.: Taunton (STD 0823) 5753
J. V. S. Pether, M.A., B.M., M.R.C.Path., D.T.M. & H., Dip.Bact. (*Director*)
Mrs. Patricia M. Benn, M.B. (*part-time*)
F. B. Greatorex, F.I.M.L.T. (*Head Technician*)
Miss Phillippa H. Trevains, B.Sc.

TEESSIDE

Public Health Laboratory, General Hospital, Ayresome Green Lane, Middlesbrough, Teesside, TS5 5AZ
Tel.: Middlesbrough (STD 0642) 87766
P. R. Mortimer, M.B., M.R.C.Path. (*Director*)
W. H. Bound, F.I.M.L.T. (*Head Technician*)

TRURO:

Public Health Laboratory, Royal Cornwall Hospital (City), Infirmary Hill, Truro
Tel.: Truro (STD 0872) 3029
G. I. Barrow, M.D., M.R.C.Path. Dip.Bact. (*Director*)
C. Ellis, F.I.M.L.T. (*Head Technician*)
J. C. K. Mills, M.A., M.B., Dip.Bact.

WAKEFIELD:

Public Health Laboratory, Wood Street, Wakefield
Tel.: Wakefield (STD 0924) 76961
L. A. Little, M.B., F.R.C.Path. Dip.Bact. (*Director*)
G. Denton, F.I.M.L.T. (*Head Technician*)
H. Fennell, B.Sc.

WATFORD:

Public Health Laboratory, Shrodells Wing, Watford General Hospital, Vicarage Road, Watford, WD1 8HB
Tel.: Watford (STD 92) 44366
B. R. Eaton, M.B., M.R.C.Path., D.C.H. (*Director*)
P. J. Sanderson, B.Sc., M.B., Ph.D., Dip.Bact.
Miss Hilda Taylor, F.I.M.L.T. (*Head Technician*)

WINCHESTER:

Public Health Laboratory, Royal Hampshire County Hospital, Winchester
Tel.: Winchester (STD 0962) 3807
M. H. Hughes, M.A., D.M., F.R.C.Path., D.T.M. & H., Dip.Bact. (*Director*)
D. I. Bartlett, F.I.M.L.T (*Head Technician*)

WOLVERHAMPTON:

Public Health Laboratory, New Cross Hospital, Wolverhampton
WV10 0QP
Tel.: Wolverhampton (STD 0902) 734311
*I. A. Harper, M.B., M.R.C.Path. (*Honorary Director*)
J. Leek, F.I.M.L.T. (*Head Technician*)
R. G. Thompson, M.R.C.S.

WORCESTER:

Public Health Laboratory, Royal Infirmary, Castle Street Branch, Worcester, WR1 3AS
Tel.: Worcester (STD 0905) 25238/9
R. J. Henderson, M.D. (*Director*)
H. R. Jenkins, F.I.M.L.T. (*Head Technician*)
M. B. Skirrow, M.B., Ph.D., M.R.C.Path., D.T.M. & H.

---

*Consultant Microbiologist employed by the Birmingham Regional Hospital Board (*see page* 44)

These Laboratories normally receive specimens only from other laboratories within or without the Service.

CROSS-INFECTION REFERENCE LABORATORY:

(*incorporating the Staphylococcus and Streptococcus Reference Laboratories*):

Central Public Health Laboratory,
Colindale Avenue, London,
NW9 5HT
Tel.: 01-205 7041

M. T. Parker, M.D., F.R.C.Path., Dip.Bact. (*Director*)
Mrs. Elizabeth A. Hall Asheshov, Ph.D., M.R.C.Path., Dip.Bact.
D. C. J. Bassett, M.B., M.R.C.Path., Dip. Bact.
Mrs. Brenda M. Brock, B.Sc.
A. W. Coe (*Head Technician*)
*N. Foord, B.Sc.
*O. M. Lidwell, D.Phil. (*Deputy Director*)
W. R. Maxted, Hon. Dr. (Leiden), M.I.Biol., F.I.M.L.T.
L. S. Nakla, M.B., Ph.D., D.L.O.
Mrs. Alison M. Pinney, B.Pharm.
Mrs. Jennifer M. Thirlwell, B.Sc.
Mrs. Adeline G. Towers, B.Sc., M.B., M.R.C.Path. (*part-time*)
Mrs. Jean P. Widdowson, B.Pharm., Ph.D., M.P.S.

DISINFECTION REFERENCE LABORATORY:

Central Public Health Laboratory,
Colindale Avenue, London,
NW9 5HT
Tel.: 01-205 7041

J. C. Kelsey, M.D., F.R.C.Path., Dip.Bact. (*Director*)
Mrs. Isobel M. Maurer, B.Sc.

DYSENTERY REFERENCE LABORATORY:

Central Public Health Laboratory,
Colindale Avenue, London,
NW9 5HT
Tel.: 01-205 7041

(Vacant) (*Director*)
L. Poudayl, M.B., D.C.P., Dip. Bact.
Miss Jennifer M. Wise, B.Sc.

ENTERIC REFERENCE LABORATORY:

Central Public Health Laboratory,
Colindale Avenue, London,
NW9 5HT
Tel.: 01-205 7041

E. S. Anderson, M.D., F.R.C.Path., Dip.Bact., F.R.S. (*Director*)
Mrs. Jacqueline Carr, B.Sc.
Miss Marian M. Darling, B.Sc.
J. D. H. de Sa, M.Sc., Ph.D.
F. J. Flynn (*Head Technician*)
Miss Anne H. Gilmour, B.Sc.
Mrs. June N. Grindley, B.Sc.
N. D. F. Grindley, B.A.
C. S. Heymann, M.B., M.R.C.Path., D.P.H., D.T.M.& H., Dip.Bact.
H. R. Smith, B.A.
E. J. Threlfall, B.Sc., Ph.D.
Mrs. Linda R. Ward, B.Sc.
Miss Jennifer A. Weaver

LEPTOSPIROSIS REFERENCE LABORATORY:

London School of Hygiene and Tropical Medicine, Keppel Street,
London, WC1E 7HT
Tel.: 01-636 8636

L. H. Turner, M.B.E., M.D., D.T.M. & H. (*Director*)
R. J. Reed (*Head Technician*)
R. Speers, B.A., Ph.D.

---

* Members of the external scientific staff of the Medical Research Council.

MYCOLOGICAL REFERENCE LABORATORY:

London School of Hygiene and Tropical Medicine, Keppel Street, London, WC1E 7HT
Tel.: 01-636 8636

(Vacant) (*Director*)
M. R. Hollingdale, B.Sc.
Miss Christine M. Philpot, B.Sc.

MYCOPLASMA REFERENCE LABORATORY:

Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT
Tel.: 01-205 7041

B. E. Andrews, M.R.C.S., F.R.C.Path., Dip.Bact. (*Director*)
R. A. Hewish, F.I.M.L.T. (*Head Technician*)
R. H. Leach, M.Sc., D.Phil. (*Deputy Director*)

SALMONELLA REFERENCE LABORATORY:

Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT
Tel.: 01-205 7041

B. Rowe, M.A., M.B., D.T.M.&H., (*Director*)
Miss Christine R. Cattran, B.A.
Miss Kathryn A. Forshaw, B.Sc.
R. J. Gross, B.A.
Mrs. Mary L. M. Hall, B.Sc.
Miss Heather A. Lance, B.Sc.
G. McGimpsey, F.I.M.L.T. (*Head Technician*)

TUBERCULOSIS REFERENCE LABORATORY:

University Hospital of Wales, Heath Park, Cardiff, CF4 4XW
Tel.: (Cardiff STD 0222) 755944

J. Marks, M.D., F.R.C.P., F.R.C.Path., Dip.Bact. (*Director*)
P. A. Jenkins, Ph.D.
J. L. Leat, B.Sc.
P. J. Patterson (*Head Technician*)
Miss Judith M. Stanton, B.Sc.

VENEREAL DISEASE REFERENCE LABORATORY:

London Hospital Research Laboratories, Ashfield Street, London, E1 2BL
Tel.: 01-790 3008

A. E. Wilkinson, M.B., F.R.C.Path., M.R.C.S. (*Director, part-time*)
Miss Nafra A. Johnston, M.D., D.R.C.O.G. (*part-time*)
G. Scrimgeour, M.B., M.R.C.Path., Dip.Bact.
A. D. Seth, M.Sc.
C. J. Storey (*Head Technician*)
Miss Christina C. Wiseman, B.Sc.

VIRUS REFERENCE LABORATORY:

Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT
Tel.: 01-205 7041

Mrs. Marguerite S. Pereira, M.D. (*Director*)
Miss Mary O. Adams (Mrs. Roebuck), M.B., Dip.Bact (*part-time*)
Mrs. Jean M. Blake, B.Sc., M.Phil.
Mrs. Patrima Chakraverty, B.Sc., M.Phil.
Miss Yvonne E. Cossart (Mrs. Wills), M.B., B.Sc., M.R.C.Path., D.C.P.
J. Craske, M.B., M.R.C.Path., Dip.Bact.
Miss Anne M. Field, B.Sc., Ph.D.
Miss Sylvia D. Gardner, M.B., M.R.C.Path., Dip.Bact.
Mrs. Patricia E. Gibson, M.Sc.
Miss Wendy A. Knowles, B.Sc.
J. R. McDonald, F.I.M.L.T. (*Senior Technical Officer*)
Mrs. E. Valerie Meurisse, M.Sc.
Miss Hazel Ratcliffe, B.Sc.
F. G. Rodgers, B.Sc.
Mrs. Elise M. Vandervelde, M.B., Dip.Bact.

Note: With the exception of smallpox and related virus diseases, rabies and the serology of typhus fever, the Virus Reference Laboratory does not receive specimens for routine diagnosis. Such specimens are received at all regional and most area laboratories and enquiries should be directed to the nearest P.H.L.S. laboratory.

COMPUTER TRIALS DEPARTMENT:

Central Public Health Laboratory,
Colindale Avenue, London,
NW9 5HT
Tel.: 01-205 7041

S. P. Lapage, M.B., M.R.C.Path., Dip.Bact. (*Director*)
M. A. Curtis, B.Sc.
B. Holmes, M.Sc.
W. R. Willcox, B.Sc.

EPIDEMIOLOGICAL RESEARCH LABORATORY:

Central Public Health Laboratory,
Colindale Avenue, London,
NW9 5HT
Tel.: 01-205 7041

T. M. Pollock, M.B., M.R.C.P.(Glasg.) (*Director*)
Mrs. Judith R. Diamond, B.Sc. (*part-time*)
W. B. Fletcher, A.M.R., F.S.S.
J. A. Lee, M.B., D.P.H.
Miss Christine L. Miller (Mrs. Manning), B.M. (*part-time*)
Miss Hilary E. Mogford, M.Sc.
Mrs. Sheila Polakoff, M.D. D.P.H.
J. W. G. Smith, M.D., M.R.C.Path., Dip.Bact. (*Deputy Director*)
Miss Mair E. M. Thomas (Mrs. Livingstone), M.B., B.Sc., F.R.C.Path., D.P.H. (*part-time*)
Mrs. Enid D. Vernon, B.Sc.

EPIDEMIOLOGICAL RESEARCH UNIT:

86 Dyer Street, Cirencester, Glos.,
GL7 2PF
Tel.: Cirencester (STD 0285)
3745 and 3330

R. E. Hope-Simpson, O.B.E., F.R.C.G.P., M.R.C.S. (*Director, part-time*)
P. G. Higgins, M.D., M.R.C.Path., Dip.Bact.
D. A. Woolley, F.I.M.L.T. (*Head Technician*)

FOOD HYGIENE LABORATORY:

Central Public Health Laboratory,
Colindale Avenue, London,
NW9 5HT
Tel.: 01-205 7041

Miss Betty C. Hobbs, O.St.J., D.Sc., F.R.C.Path., Dip.Bact. (*Director*)
A. C. Ghosh, B.Sc., B.V.Sc. & A.H., M.Phil.
R. J. Gilbert, M.Pharm., Ph.D., Dip.Bact., M.P.S.
Miss Margaret Kendall, F.I.M.L.T. (*Head Technician*)
Miss Diane Roberts, B.Sc.
Miss Antonnette A. Wieneke, Drs. (Holland)

NATIONAL COLLECTION OF TYPE CULTURES:

Central Public Health Laboratory,
Colindale Avenue, London,
NW9 5HT
Tel.: 01-205 7041

S. P. Lapage, M.B., M.R.C.Path., Dip.Bact. (*Curator*)
P. J. Fisher (*Head Technician*)
L. R. Hill, M.Sc., M.I.Biol. (*Deputy Curator*)
R. Johnson, B.Sc.
R. J. Owen, B.Sc.
K. D. Phillips, B.Sc.
K. F. Redway, B.Sc.

STANDARDS LABORATORY FOR SEROLOGICAL REAGENTS:

Central Public Health Laboratory,
Colindale Avenue, London,
NW9 5HT
Tel.: 01-205 7041

Mrs. C. M. Patricia Bradstreet, M.B., F.R.C.Path., Dip.Bact. (*Director*)
Miss E. Margaret Bailey, B.Sc.
M. J. Colston, B.Sc.
Mrs. Mabel W. Dighero, B.Sc.
Mrs. Joan M. B. Edwards, M.B., M.R.C.Path. (*Deputy Director, part-time*)
J. Foreman, F.I.M.L.T. (*Head Technician*)
Miss Diana J. Nivison, B.Sc.
Miss Agnes J. Tannahill, B.Sc.

JUNIOR BACTERIOLOGISTS IN TRAINING

(*Attending course at the London School of Hygiene and Tropical Medicine for Diploma in Bacteriology*)

1970-71

A. M. R. Mackenzie, B.A., B.M., B.Sc., M.R.C.Path.

G. E. Rich, M.B.

1971-72

A. D. Pearson, B.A., B.M.

(*Attending course at the University of Manchester for Diploma in Bacteriology*)

1971-72

C. Roberts, M.D.

STAFF ON SECONDMENT

T. T. Donovan, F.I.M.L.T. (*to Jinnah Postgraduate Medical Centre, Karachi, Pakistan*)

E. McKay-Ferguson, M.B., M.R.C.S. (*to St. George's Hospital, London*)

P. P. Mortimer, B.A., M.B. (*to St. Stephen's Hospital, Chelsea, London*)

T. N. Stanbridge, M.B., M.R.C.S., Dip. Bact. (*to University of Manchester*)

HOSPITAL PATHOLOGICAL LABORATORIES DESIGNATED "RECOGNISED"

at which arrangements are made for the examination of public health specimens for the Service

AYLESBURY
  Stoke Mandeville Hospital, Aylesbury, Buckinghamshire.
BOLTON
  Royal Infirmary, Bolton, Lancashire.
WIGAN
  Royal Infirmary, Wigan, Lancashire.

Consultant Microbiologists employed by Regional Hospital Boards in the Hospital Service, who are associated on a part-time or honorary basis with the Public Health Laboratory Service

F. A. J. BRIDGWATER, M.B., M.R.C.Path., Dip. Bact. (*See page* 30.)
East Birmingham Hospital, Bordesley Green East, Birmingham, 9.
Tel.: 021-772 4021.

T. H. FLEWETT, M.D., F.R.C.Path.
Regional Virus Laboratory, East Birmingham Hospital, Bordesley Green East, Birmingham, 9.
Tel.: 021-772 4021.

G. L. GIBSON, M.D., M.R.C.Path.
Group Pathology Laboratories, County Hospital, York, YO3 7PG.
Tel.: York (STD 0904) 25314.

I. A. HARPER, M.B., M.R.C.Path. (*See page* 39.)
Wolverhampton Group of Hospitals, and Honorary Director, Public Health Laboratory, New Cross Hospital, Wolverhampton.
Tel.: Wolverhampton (STD 0902) 734311.

W. L. HOOPER, B.Sc., M.B., M.R.C.Path., Dip.Bact. (*See page* 37)
Bournemouth & East Dorset Group of Hospitals, Public Health Laboratory, Poole General Hospital, Poole, Dorset, BH15 2JB.
Tel.: Poole (STD 02013) 5771.

D. N. HUTCHINSON, M.D., Dip.Bact. (*See page* 37.)
Group Laboratory, Royal Infirmary, Meadow Street, Preston.
Tel.: Preston (STD 0772) 57886.

Miss M. PATRICIA JEVONS, M.D., M.R.C.Path., Dip.Bact.
Group Pathology Laboratories, St. Stephen's Hospital, Chelsea, London, S.W.10.
Tel.: 01-352 8161.

M. LONGSON, B.Sc., M.D.
Department of Virology, Withington Hospital, Manchester, M20 8LR
Tel.: 061-445 8111

D. A. McSWIGGAN, L.R.C.P.I., M.R.C.Path., D.T.M. & H., Dip. Bact. (*See page* 35.)
Department of Microbiology, Central Middlesex Hospital, Park Royal, London, N10 7TN.
Tel.: 01-965 5733.

T. D. M. MARTIN, F.R.C.Path. M.R.C.S.,
Department of Pathology, Royal Berkshire Hospital, Reading, Berkshire.
Tel.: Reading (STD 0734) 83444.

J. M. MOORE, M.D., M.R.C.Path.
Bacteriology Laboratory, Doncaster Royal Infirmary, Doncaster, Yorkshire.
Tel.: Doncaster (STD 0302) 2286.

D. S. REEVES, M.B., M.R.C.S., M.R.C.Path.
Department of Microbiology, Southmead Hospital, Westbury-on-Trym, Bristol, BS10 5NB.
Tel.: Bristol (STD 0272) 62-2821.

J. M. TALBOT, M.D., M.R.C.Path., Dip.Bact.
Department of Pathology, Kingston Hospital, 37 Coombe Road, Kingston upon Thames, Surrey.
Tel.: 01-546 7711.

W. R. G. THOMAS, M.B., M.R.C.S., M.R.C.Path., D.T.M. & H., Dip.Bact.
Bacteriology Laboratory, Mayday Hospital, Mayday Road, Thornton Heath, Surrey CR4 7YE.
Tel.: 01-684 6999.

D. C. TURK, D.M., M.R.C.P., M.R.C.Path.
Department of Bacteriology, Radcliffe Infirmary, Oxford. *Tel.:* Oxford (STD 0865) 49891.

Mrs. BETTY E. WALLACE, M.A., M.D., F.R.C.Path., B.A.O.
Department of Clinical Microbiology, Royal Sussex County Hospital, Brighton, BN2 5BE.
Tel.: Brighton (STD 0273) 66611.

R. FRASER WILLIAMS, M.B., M.R.C.Path.
Department of Pathology, Monsall Hospital, Newton Heath, Manchester, M10 8WR.
Tel.: 061-205 2254.

REFERENCE EXPERTS

In the following list the name of the expert who is responsible for the relevant examination is given. Reference experts normally receive specimens only from other laboratories within and without the Service. It should be added, however, that all regional and most area laboratories are undertaking the routine diagnosis of virus infections, and that several laboratories are undertaking the serological identification of members of the *Salmonella* group, the serological diagnosis of leptospiral infections, and the bacteriophage-typing of strains of *Staphylococcus aureus*. For this reason enquiries on these subjects should usually be addressed to the local public health laboratory.

Amoebiasis, diagnosis of

A. L. Jeanes, M.D., M.R.C.Path., Department of Clinical Pathology, Guy's Hospital, London, S.E.1. *Tel.:* 01-407 7600, *Ext.* 225.

Anaerobes, identification

A. T. Willis, M.D., D.Sc., Ph.D., M.R.A.C.P., M.R.C.Path., M.C.P.A., Public Health Laboratory, Luton and Dunstable Hospital, Lewsey Road, Luton, LU4 0DZ. *Tel.:* Luton (STD 0582) 52007.

Anthrax bacilli, identification

Miss Joan R. Davies, M.D., Dip.Bact. *To 30th November*, 1971: Bacteriological Laboratory (P.H.L.S.), Room 617, County Hall, London, S.E.1. *Tel.:* 01-928 3467. *From 1st December*, 1971: Public Health Laboratory, St. Luke's Hospital, Guildford. *Tel.:* Guildford (STD 0483) 66091

Anthrax, examination under Wool and Hair Regulations

T. F. Elias-Jones, M.B., F.R.C.Path., The City Laboratory, 23 Montrose Street, Glasgow, C.1. *Tel.:* 041-221 9600 and 4348, *Ext.* 2400.

H. G. M. Smith, M.B., Ph.D., Dip.Bact., Public Health Laboratory, 16–18 Edmund Street, Bradford, BD5 0BH. *Tel.:* Bradford (STD 0274) 24314.

Miss Joan R. Davies, M.D., Dip.Bact. *To 30th November*, 1971: Bacteriological Laboratory (P.H.L.S.), Room 617, County Hall, London, S.E.1. *Tel.:* 01-928 3467. *From 1st December*, 1971: Public Health Laboratory, St. Luke's Hospital, Guildford. *Tel.:* Guildford (STD 0483) 66091.

G. C. Turner, M.D., F.R.C.Path., Public Health Laboratory, 126 Mount Pleasant, Liverpool, L3 5SU. *Tel.:* 051-709 3636.

Arboviruses

J. S. Porterfield, M.D., M.R.C.S., L.R.C.P., National Institute for Medical Research, Mill Hill, London, NW7 1AA. *Tel.:* 01-959 3666.

Arizona group, identification

B. Rowe, M.A., M.B., D.T.M.&H., Salmonella Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT. *Tel.:* 01-205 7041.

Brucella, identification

D. J. H. Payne, M.B., F.R.C.Path., Dip.Bact., Public Health Laboratory, St. Mary's General Hospital, East Wing, Milton Road, Portsmouth, PO3 6AQ. *Tel.:* Portsmouth (STD 0705) 22331.

Cholera and related vibrios, identification

Dysentry Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT. *Tel.:* 01-205 7041.

Clostridium welchii, serological typing

Miss Betty C. Hobbs, O.St.J., D.Sc., F.R.C.Path., Dip.Bact., Food Hygiene Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT. *Tel.:* 01-205 7041.

Coxsackie A viruses

D. R. Gamble, M.B., M.R.C.Path., Dip.Bact., Public Health Laboratory, West Park Hospital, Epsom. *Tel.:* Epsom 01-39 26633.

Cytomegaloviruses

H. Stern, M.B., Ph.D., M.R.C.Path., Virus Department, St. George's Hospital Medical School, Hyde Park Corner, London, S.W.1.
Tel.: 01-235 4343, *Ext.* 147.

Regional Centres for Cytomegaloviruses Complement Fixation Tests

Bristol: Suzanne K. R. Clarke, M.D., M.R.C.Path., Public Health Laboratory, Myrtle Road, Kingsdown, Bristol, BS2 8EL. *Tel.:* Bristol (STD 0272) 21326.

Leeds: M. H. Hambling, M.D., M.R.C.Path., D.(Obst.)R.C.O.G., Dip.Bact., Public Health Laboratory, Bridle Path, York Road, Leeds, LS15 7TR.
Tel.: Leeds (STD 0532) 645011.

Manchester: J. O'H. Tobin, B.M., M.R.C.Path., Dip.Bact., Public Health Laboratory, Withington Hospital, Manchester, M20 8LR.
Tel.: 061-445 2416.

Virus Reference Laboratory: Miss Sylvia D. Gardner, M.B., M.R.C.Path., Dip.Bact., Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT. *Tel.:* 01-205 7041.

Disinfection

J. C. Kelsey, M.D., F.R.C.Path., Dip.Bact., Disinfection Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT. *Tel.:* 01-205 7041.

Drug Resistance in Enterobacteria

E. S. Anderson, M.D., F.R.C.Path., Dip.Bact., F.R.S., Enteric Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT. *Tel.:* 01-205 7041.

Dysentery bacilli, typing

Dysentery Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT. *Tel.:* 01-205 7041.

Enteric Fever

(*a*) Serological investigation of suspected cases and carriers.
(*b*) Phage-type and ecological study of strains of typhoid and paratyphoid bacilli, and of *Salmonella typhimurium* and certain other salmonella serotypes.

E. S. Anderson, M.D., F.R.C.Path., Dip.Bact., F.R.S., Enteric Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT. *Tel.:* 01-205 7041.

Entomological specimens, investigation

B. R. Laurence, Ph.D., Department of Entomology, London School of Hygiene and Tropical Medicine, Keppel Street, London, WC1E 7HT.
Tel.: 01-636 8636.

Escherichia coli, typing

B. Rowe, M.A., M.B., D.T.M.&H., Salmonella Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT.
Tel.: 01-205 7041.

Farmer's lung, serological diagnosis

Mycological Reference Laboratory, London School of Hygiene and Tropical Medicine, Keppel Street, London, WC1E 7HT. *Tel.:* 01-636 8636.

D. G. Davies, M.D., F.R.C.Path., Dip.Bact., Public Health Laboratory, Cumberland Infirmary, Carlisle. *Tel.:* Carlisle (STD 0228) 23654

J. E. Jameson, M.R.C.S. Public Health Laboratory, Royal Sussex County Hospital, Brighton, BN2 5BE. *Tel.:* Brighton (STD 0273) 63506.

B. Moore, M.D., B.Sc., F.R.C.Path., B.A.O., Public Health Laboratory, Church Lane, Heavitree, Exeter, EX2 5AD. *Tel.:* Exeter (STD 0392) 77833.

H. D. S. Morgan, M.R.C.S., F.R.C.Path., Dip.Bact., Public Health Laboratory West Wales General Hospital, Glangwili, Carmarthen.
Tel.: Carmarthen (STD 0267) 7271.

M. Sussman, Ph.D., M.I.Biol., The Welsh National School of Medicine, Department of Bacteriology, The Royal Infirmary, Cardiff, CF2 1SZ.
Tel.: Cardiff (STD 0222) 33101.

D. M. Weir, M.D., Immunology Unit, Department of Bacteriology, Edinburgh University Medical School, Teviot Place, Edinburgh.
Tel.: 031-667 1011, *Ext.* 2256.

*Food Poisoning**

Miss Betty C. Hobbs, O.St.J., D.Sc., F.R.C.Path., Dip.Bact., Food Hygiene Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT. *Tel.:* 01-205 7041.

Fungi (pathogenic), identification

Mycological Reference Laboratory, London School of Hygiene and Tropical Medicine, Keppel Street, London, WC1E 7HT. *Tel.:* 01-636 8636.

Helminthological specimens, investigation

Professor G. S. Nelson, M.D., D.Sc., D.T.M.&H., D.A.P.&E., London School of Hygiene and Tropical Medicine, Keppel Street, London, WC1E 7HT. *Tel.:* 01-636 8636.

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* Owing to the perishable nature of most foodstuffs, material for investigation from outbreaks of food poisoning should normally be sent to the nearest public health laboratory. The reference laboratory should be used mainly for non-perishable articles of food, especially when litigation may arise, and for the identification of strains.

Hydatid disease, complement-fixation test for

Mrs. C. M. Patricia Bradstreet, M.B., F.R.C.Path., Dip.Bact., Standards Laboratory for Serological Reagents, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT. *Tel.:* 01-205 7041.

Immunofluorescence

C. E. D. Taylor, M.A., M.D., M.R.C.Path., Dip.Bact., Central Middlesex Hospital, Park Royal, London, NW10 7NS. *Tel.:* 01-965 5733.

Influenza

L. Hoyle, M.B., Public Health Laboratory, General Hospital, Northampton, NN1 5BD. *Tel.:* Northampton (STD 0604) 34347.

Mrs. Marguerite S. Pereira, M.D., Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT.
Tel.: 01-205 7041.

Listeria typing

Miss Agnes J. Tannahill, B.Sc., Standards Laboratory for Serological Reagents, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT.
Tel.: 01-205 7041.

Malaria parasites and other blood protozoa

Professor P. C. C. Garnham, C.M.G., M.D., D.Sc., F.R.C.P., F.R.S., Imperial College Field Station, Ashurst Lodge, Ascot, Berkshire.
Tel.: Ascot (STD 0990) 22204.

Meningococci, typing

Mrs. C. M. Patricia Bradstreet, M.B., F.R.C.Path., Dip.Bact., Standards Laboratory for Serological Reagents, Central Public Health Laboratory, Colindale Avenue, London, NW9. *Tel.:* 01-205 7041.

Parasitic infections, serological diagnosis of

D. S. Ridley, B.Sc., M.D., F.R.C.Path., Department of Pathology, Hospital for Tropical Diseases, 4 St. Pancras Way, London, N.W.1.
Tel.: 01-387 4411.

Pasteurella pseudotuberculosis

N. S. Mair, M.B., F.R.C.Path., D.C.H., D.P.H., Dip.Bact., Public Health Laboratory, Groby Road Hospital, Leicester, LE3 9QE.
Tel.: Leicester (STD 0533) 872283.

Plague, investigation

R. J. Henderson, M.D., Public Health Laboratory, Royal Infirmary, Castle Street Branch, Worcester, WR1 3AS. *Tel.:* Worcester (STD 0905) 25238/9.

Pneumococci, typing of, from epidemics

M. T. Parker, M.D., F.R.C.Path., Dip.Bact., Cross-Infection Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT. *Tel.:* 01-205 7041.

Poliomyelitis, marker tests

Miss Yvonne E. Cossart, M.B., B.Sc., M.R.C.Path., D.C.P., Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT. *Tel.:* 01-205 7041.

Protective cabinets

O. M. Lidwell, D.Phil., Cross-Infection Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT.
Tel.: 01-205 7041.

Protozoological specimens, investigation

Professor W. H. R. Lumsden, D.Sc., M.B., M.R.C.P.E., D.T.M., D.T.H., F.R.S.E., Department of Medical Protozoology, London School of Hygiene and Tropical Medicine, Keppel Street, London, WC1E 7HT.
Tel.: 01-636 8636.

Psittacosis, isolation of causative agent

Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT. *Tel.:* 01-205 7041.

Rabies, laboratory tests for diagnosis
Miss Sylvia D. Gardner, M.B., M.R.C.Path., Dip. Bact., Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT. *Tel.:* 01-205 7041.

Rickettsia
A. D. Evans, M.B., B.Sc., M.R.C.Path., Dip.Bact., Public Health Laboratory, University Hospital of Wales, Heath Park, Cardiff, CF4 4XW.
Tel.: Cardiff (STD 0222) 755944.

Salmonella organisms, typing
B. Rowe, M.A., M.B., D.T.M.&H., Salmonella Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT.
Tel.: 01-205 7041.

Smallpox, laboratory tests for diagnosis
Birmingham: H. S. Bedson, M.D., M.R.C.P.,
Professor N. P. L. Wildy, M.B., M.R.C.S., F.R.S.E.,
Department of Virology and Bacteriology, The University, Birmingham, 15.
Tel.: 021-472 1301. *Night extension:* 021-472 3524.

Bristol: Miss Suzanne K. R. Clarke, M.D., M.R.C.Path., Public Health Laboratory, Myrtle Road, Kingsdown, Bristol, BS2 8EL.
Tel.: Bristol (STD 0272) 21326.

Cardiff: A. D. Evans, M.B., B.Sc., M.R.C.Path., Dip. Bact., Public Health Laboratory, University Hospital of Wales, Heath Park, Cardiff, CF4 4XW.
Tel.: Cardiff (STD 0222) 755944.

Leeds: M. H. Hambling, M.D., M.R.C.Path., D.(Obst.)R.C.O.G., Dip. Bact., Public Health Laboratory, Bridle Path, York Road, Leeds, LS15 7TR.
Tel.: Leeds (STD 0532) 645011.

Liverpool: Professor K. McCarthy, M.D., F.R.C.Path., Department of Medical Microbiology, New Medical School, Ashton Street, P.O. Box 147, Liverpool, L69 3BX. *Tel.:* 051-709 6022 *Ext.* 202

London: Mrs. Marguerite S. Pereira, M.D., Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT.
Tel.: 01-205 7041.

Newcastle: J. H. Hale, O.B.E., M.D., F.R.C.Path., M.R.C.P., Public Health Laboratory, Institute of Pathology, General Hospital, Westgate Road, Newcastle upon Tyne, NE4 6BE.
Tel.: Newcastle (STD 0632) 38811, *Ext.* 297.

Staphylococcal enterotoxin, typing

R. J. Gilbert, M.Pharm., Ph.D., Dip.Bact., M.P.S., Food Hygiene Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT. *Tel.:* 01-205 7041.

Staphylococci, bacteriophage-typing

M. T. Parker, M.D., F.R.C.Path., Dip.Bact., Cross-Infection Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT. *Tel.:* 01-205 7041.

Streptococci of Group A, typing

M. T. Parker, M.D., F.R.C.Path., Dip.Bact., Cross-Infection Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT. *Tel.:* 01-205 7041.

Regional Typing Laboratories

(i) *Northern and South-Eastern Counties:* Cumberland, Co. Durham, Lancs., Northumberland, Westmorland, Yorks,. Dorset, Hants., Kent, London, Surrey, Sussex.

M. T. Parker, M.D., F.R.C.Path., Dip.Bact., Cross-Infection Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT. *Tel.:* 01-205 7041.

(ii) *Eastern Counties:* Beds., Cambs., Derby, Essex, Herts., Hunts., Leics., Lincs., Norfolk, Northants., Notts., Rutland, Suffolk.

Miss Joan M. Boissard, M.R.C.S., Public Health Laboratory, Tennis Court Road, Cambridge, CB2 1QR. *Tel.:* Cambridge (STD 0223) 55526 and 57573.

(iii) *Western Counties:* Berks., Bucks., Cheshire, Cornwall, Devon, Glos., Hereford, Oxon., Salop, Somerset, Staffs., Warw., Wilts., Worcs.

Public Health Laboratory, Radcliffe Infirmary, Oxford, OX2 6AH.
Tel.: Oxford (STD 0865) 49231/2.

(iv) *Wales.*

Professor Scott Thomson, M.D., F.R.C.P.E., F.R.C.Path., D.P.H., Department of Microbiology, University Hospital, Heath Park, Cardiff, CF4 4XW.
Tel.: Cardiff (STD 0222) 755944.

Toxoplasmosis

North

G. B. Ludlam, M.D., F.R.C.Path., D.T.M.&H., D.L.O., Public Health Laboratory, Bridle Path, York Road, Leeds, LS15 7TR.
Tel.: Leeds (STD 0532) 645011.

South (excluding London)

W. Kwantes, M.A., M.B., F.R.C.Path., Dip.Bact., Public Health Laboratory, Cockett Road, Swansea, SA2 0FA. *Tel.:* Swansea (STD 0792) 24041.

London

D. G. Fleck, M.D., M.R.C.Path., Dip.Bact., Public Health Laboratory, St. George's Hospital, Tooting Grove, London, S.W.17.
Tel.: 01-672 1255.

Trichinosis, examination of rats and pigs

Professor G. S. Nelson, M.D., D.Sc., D.T.M.&H., D.A.P.&E., London School of Hygiene & Tropical Medicine, Keppel Street, London, WC1E 7HT. *Tel.:* 01-636 8636.

Tubercle bacilli and other mycobacteria

J. Marks, M.D., F.R.C.P., F.R.C.Path., Dip.Bact., Tuberculosis Reference Laboratory, University Hospital of Wales, Heath Park, Cardiff, CF4 4XW.
Tel.: Cardiff (STD 0222) 755944.

Regional Centres for Tuberculosis Bacteriology

Birmingham: F. A. J. Bridgwater, M.B., M.R.C.Path., Dip.Bact., East Birmingham Hospital, Bordesley Green East, Birmingham, 9.
Tel.: 021-772 4021.

Bristol: H. R. Cayton, M.B., F.R.C.Path., Public Health Laboratory, Myrtle Road, Kingsdown Bristol, BS2 8EL. *Tel.:* Bristol (STD 0272) 21326.

Liverpool: G. C. Turner, M.D., F.R.C.Path., Public Health Laboratory, 126 Mount Pleasant, Liverpool, L3 5SU.
Tel.: 051-709 3636/7.

London: C. H. Collins, M.I.Biol., F.I.M.L.T., Bacteriological Laboratory (P.H.L.S.), Room 617, County Hall, Westminster Bridge, London, S.E.1.
Tel.: 01-928 3467.

Manchester: J. D. Abbott, M.D., M.R.C.Path., Dip.Bact., Public Health Laboratory, Withington Hospital, Manchester, M20 8LR.
Tel.: 061-445 2416.

Newcastle: J. B. Selkon, M.B., M.R.C.Path., D.C.P., Public Health Laboratory, Institute of Pathology, General Hospital, Westgate Road, Newcastle upon Tyne, NE4 6BE. *Tel.:* Newcastle (STD 0632) 38811, *Ext.* 297.

Wakefield: L. A. Little, M.B., F.R.C.Path., Dip.Bact., Public Health Laboratory, Wood Street, Wakefield. *Tel.:* Wakefield (STD 0924) 76961.

Typhus fever, serological tests*

Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT. *Tel.:* 01-205 7041.

Venereal diseases, Treponemal immobilisation test

A. E. Wilkinson, M.B., F.R.C.Path., M.R.C.S., Venereal Diseases Reference Laboratory, London Hospital Research Laboratories, Ashfield Street, London, E1 2BL. *Tel.:* 01-790 3008.

Midlands

P. J. L. Sequiera, M.B., The Central Serology Laboratory, Withington Hospital, West Didsbury, Manchester, M20 8LR.
Tel.: Manchester (STD 061-445) 7683.

North

J. H. Hale, O.B.E., M.D., F.R.C.Path., M.R.C.P., Public Health Laboratory, Institute of Pathology, General Hospital, Westgate Road, Newcastle upon Tyne, NE4 6BE. *Tel.:* Newcastle (STD 0632) 38811, *Ext.* 297.

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* The Weil-Felix test can be carried out in all constituent laboratories of the Service, and also in a number of hospital laboratories. Only sera giving a doubtful reaction should be sent to the Virus Reference Laboratory.

VACCINES AND OTHER IMMUNOLOGICAL MATERIALS OBTAINABLE THROUGH THE PUBLIC HEALTH LABORATORY SERVICE

For the address of P.H.L.S. laboratories *see* pp. 26–35

Rabies Vaccine

Stocks are held by the P.H.L.S. laboratories at:

Liverpool
London (Colindale)
Newcastle
Cardiff

Anthrax Vaccine

Stocks are held by the P.H.L.S. laboratories at:

Bradford
Liverpool
London (Colindale)

Human immunoglobulin

Immunoglobulin prepared from the pooled plasma of normal healthy adults is obtainable on request from regional or area laboratories (but *not* from the Central Public Health Laboratory, Colindale). So far as supplies allow, it is issued for the protection of women in contact with rubella during the first three months of pregnancy. It is also issued for contacts of measles and infectious hepatitis in circumstances of special risk.

**Anti-vaccinial human immunoglobulin*

In addition to normal human immunoglobulin, a stock of immunoglobulin prepared from the blood of persons recently vaccinated against smallpox is held for the treatment of cases of generalised vaccinia, eczema, vaccinatum, accidental vaccinial infections endangering the eye, and, in special circumstances, for the protection of unvaccinated smallpox contacts. This anti-vaccinial human immunoglobulin may be obtained from the P.H.L.S. laboratories at:

Birmingham
Bristol
Cambridge
Cardiff
Gloucester
Leeds
Leicester
Liverpool
London (Colindale)
Manchester
Newcastle
Oxford
Sheffield

Material for intradermal diagnostic tests

Frei antigen for Lymphogranuloma inguinale, Brucellin for Undulant fever, Trichina antigen for Trichinosis, Hydatid antigen for Hydatid disease, and cat-scratch fever antigen can be obtained from the P.H.L.S. Standards Laboratory, which also issues, to any pathologist, Kveim antigen for sarcoidosis. Enquiries relating to fungal antigens should be addressed to the P.H.L.S. Mycology Reference Laboratory.

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* Urgent requests for rabies vaccine or antiserum and anti-vaccinial human immunoglobulin only are received at any time at the Central Public Health Laboratory, Colindale.

Notes on other immunological materials obtainable from special centres:

1. *Antisera for therapeutic use*

Obtainable through the Hospital Pathological Service (see appendix to HM (70)37) from which the list below is abstracted:

(a) anthrax antiserum
(b) botulinum antitoxin
(c) human antitetanus immunoglobulin
(d) ovine antitetanus serum

Note: L = Pathology Laboratory P = Pharmacy

Region 1

L	Carlisle, Cumberland Infirmary	abcd
P	Newcastle, General Hospital	abcd
	Catterick, O.C. Military Hospital	c

Region 2

L	Hull, Castle Hill Hospital	abcd
P	Leeds, Seacroft Hospital	abcd

Region 3

P	Nottingham, City Hospital	abcd

Region 4

	Cambridge, Regional Transfusion Centre	abcd

Region 5

P	London, N.7, Royal Northern Hospital	a
P	Edgware, General Hospital	bcd

Region 6

L	London, N.18, North Middlesex Hospital	abcd
	Colchester, O.C. Military Hospital	c

Region 7

	Southborough, S.E. Depot, Blood Transfusion Centre	abcd

Region 8

	Tooting, Director, South London Transfusion Centre, Tooting Grove	abcd
	Aldershot, O.C. Cambridge Military Hospital	c

Region 9

L	Northampton, General Hospital	abcd
P	Reading, Royal Berks. Hospital	abcd
P	Oxford, Churchill Hospital	c
P	Oxford, Radcliffe Infirmary (day only)	d

Region 10

P	Bristol, Ham Green Hospital	abcd
L	Exeter, Royal Devon and Exeter Hospital	abcd
	Plymouth, O. i/c Accident Department, General Hospital, Freedom Fields	abcd
P	Truro, Royal Cornwall Hospital, Treliske Branch	abcd

Region 11

P	Cardiff, Royal Infirmary	abcd
L	Bangor, Caernarvon and Anglesey General Hospital	abcd
P	Wrexham, Maelor General Hospital	abcd
	Swansea, Med. Supt., Swansea Hospital	ab
P	Carmarthen, West Wales General Hospital	bcd
P	Aberystwyth, Bronglais District General Hospital	bcd

Region 12

P	Shrewsbury, Royal Salop Infirmary	acd
P	Birmingham 29, Selly Oak Hospital	abcd
P	Stoke-on-Trent, North Staffs Royal Infirmary	acd

Region 13

P	Manchester, Royal Infirmary	abcd

Region 14

P	Liverpool 9, Fazakerley Hospital	abcd

Region 15

P	Southampton, Royal South Hants. Hospital	abcd
P	Salisbury, Odstock Hospital	a
	Salisbury, Accident Department, General Hospital	cd
P	Dorchester, Director, Public Health Laboratory	cd
P	Portsmouth, Royal Portsmouth Hospital	cd

2. *Yellow fever inoculation*
   A list of centres can be obtained from the Department of Health and Social Security, Alexander Fleming House, Elephant and Castle, London, S.E.1.

3. *TABC, cholera, typhus and other vaccines*
   Most of these are available commercially.

4. *Smallpox Vaccine*
   Obtainable from Public Health Departments of Local Authorities (Counties, County Boroughs and London Boroughs).

APPENDIX I

COMMITTEES AND WORKING PARTIES

Food Investigation

Chairman and Secretary: J. H. McCoy, M.B., D.P.H.

E.S. Anderson, M.D., F.R.C.Path., Dip.Bact., F.R.S.
R. W. S. Harvey, B.Sc., M.D., F.R.C.Path., Dip.Bact.
Miss Betty C. Hobbs, D.Sc., F.R.C.Path., Dip.Bact.
W. Kwantes, M.A., M.B., F.R.C.Path., Dip.Bact.
H. D. S. Morgan, M.R.C.S., F.R.C.Path., Dip.Bact.
H. G. M. Smith, M.B., Ph.D., Dip.Bact.
Mrs. Joan Taylor, M.B., B.Sc., F.R.C.Path., D.P.H.
S. Brightwell, M.Sc., D.I.C., A.R.I.C. (*Messrs. J. Sainsbury, Ltd., to give technical advice on trade matters*)
M. Ingram, M.A., Ph.D. (*Meat Research Institute*)

Steering Committee on Antibiotic Resistance of Pathogens

Chairman: M. T. Parker, M.D., F.R.C.Path., Dip.Bact.

Secretary: A. L. Furniss, M.D., Dip.Bact.

J. D. Abbott, M.D., M.R.C.Path., Dip.Bact.,
E.S. Anderson, M.D., F.R.C.Path., Dip.Bact., F.R.S.
J. C. Kelsey, M.D., F.R.C.Path., Dip.Bact.
T. M. Pollock, M.B., M.R.C.P.(Glasg.)
Mrs. Joan Taylor, M.B., B.Sc., F.R.C.Path., D.P.H.
A. E. Wright, T.D., M.D., M.R.C.Path., D.P.H., Dip.Bact.

Standing Committee on Bacteriological Examination of Water Supplies

Chairman: B. Moore, M.D., B.Sc., F.R.C.Path., B.A.O.

Secretary: L. A. Little, M.B., F.R.C.Path., Dip.Bact.

G. I. Barrow, M.D., M.R.C.Path., Dip.Bact.
P. B. Crone, M.D., Dip.Bact.
R. D. Gray, M.D., F.R.C.Path., D.P.H.
J. E. Jameson, M.R.C.S.
J. H. McCoy, M.B., D.P.H.
R. Pilsworth, M.D., Dip.Bact.
J. A. Rycroft, M.B., M.R.C.Path., Dip.Bact.
A. J. Kingsley Smith, B.M., M.R.C.Path.
Miss Joan M. Watkinson, B.Sc.
R. G. Allen, B.Sc., Ph.D., F.Inst.P. (*Water Research Association*)
F.W. Bunting, M.B.E., M.D., D.P.H. (*Society of Medical Officers of Health*)
N. P. Burman, B.Sc., Ph.D. (*Metropolitan Water Board*)
G. U. Houghton, Ph.D., F.R.I.C. (*South Essex Waterworks Company*)
A. E. Martin, M.D., D.P.H. (*Department of Health and Social Security*)
E. Windle-Taylor, C.B.E., M.A., M.D., F.R.C.Path., D.P.H. (*Metropolitan Water Board*)

Joint Public Health Laboratory Service/Animal Health Division Standing Advisory Committee

P.H.L.S. Members	*Veterinary Members*
E. S. Anderson, M.D., F.R.C.Path., Dip.Bact., F.R.S.	A. C. L. Brown, M.R.C.V.S.
J. H. McCoy, M.B., D.P.H.	M. L. Burdin, O.B.E., B.Sc., M.R.C.V.S.
D. J. H. Payne, M.B., F.R.C.Path., Dip.Bact.	A. J. Stevens, M.A., B.V.Sc., M.R.C.V.S., Dip.Bact.

Advisory Sub-Committee on Application and Report Forms

Chairman: G. T. Cook, M.D., F.R.C.Path.
Secretary: R. Pilsworth, M.D., Dip.Bact.

Advisory Sub-Committee on Laboratory Supplies

Chairman: Miss Joan R. Davies, M.D., Dip.Bact.
Secretary: A. Waltho

Library Advisory Committee

Joint Chairmen:
B. Moore, M.D., B.Sc., F.R.C.Path., B.A.O.
Miss Betty H. Whyte, M.A., A.L.A.
Secretary: Miss Betty H. Whyte, M.A., A.L.A.

Standing Committee on Office Equipment and Methods

Chairman: J. H. Hale, O.B.E., M.D., F.R.C.Path., M.R.C.P.
Secretary: A. Waltho

Standing Committee on Technicians

Chairman: R. J. Henderson, M.D.
Secretary: J. W. Bushell

Communicable Disease Report Working Party

Chairman: T. M. Pollock, M.B., M.R.C.P. (Glasg.)
Secretary: Mrs. Enid D. Vernon, B.Sc.

H. R. Cayton, M.B., M.R.C.Path.
Miss Lynette M. Dowsett, M.D., F.R.C.Path.
W. B. Fletcher, A.M.R., F.S.S.
M. H. Hughes, M.A., D.M., F.R.C.Path., D.T.M.&H., Dip.Bact.
J. C. Kelsey, M.D., F.R.C.Path., Dip.Bact.
S. P. Lapage, M.B., M.R.C.Path., Dip.Bact.
D. L. Miller, M.D., D.P.H.
E. R. Mitchell, M.B., M.R.C.Path., Dip.Bact.
B. Moore, M.D., B.Sc., F.R.C.Path., B.A.O.
Professor Scott Thomson, M.D., F.R.C.P.E., F.R.C.Path., D.P.H.
J. O'H. Tobin, B.M., M.R.C.Path., Dp.Bact.
R. H. Westlake
B. K. Kelly, M.A. (*Medical Research Council Computer Services Centre*)

Working Party on Epidemic Non-Bacterial Gastro-Enteritis

Chairman: B. Moore, M.D., B.Sc., F.R.C.Path., B.A.O.

Secretary: Miss Suzanne K. R. Clarke, M.D., M.R.C.Path.

G. T. Cook, M.D., F.R.C.Path.
M. H. Hughes, M.A., D.M., F.R.C.Path., D.T.M.&H., Dip.Bact.
J. E. Jameson, M.R.C.S.
D. L. Miller, M.D., D.P.H.
E. R. Mitchell, M.B., M.R.C.Path., Dip.Bact.
T. D. F. Money, M.A., M.B., D.(Obst.)R.C.O.G.
J. O'H. Tobin, B.M., M.R.C.Path., Dp.Bact.
J. E. M. Whitehead, M.B., F.R.C.Path., Dip.Bact.
D. C. Ower, M.B., D.(Obst.)R.C.O.G. (*Department of Health and Social Security*)

Working Party on Brucellosis

Chairman: L. Robertson, M.A., B.M., M.R.C.Path., Dip.Bact.

Secretary: J. G. Wallace, B.M., M.R.C.Path., D.C.P., Dip.Bact.

G. I. Barrow, M.D., M.R.C.Path., Dip.Bact.
Mrs. C. M. Patricia Bradstreet, M.B., F.R.C.Path., Dip.Bact.
I. D. Farrell, B.Sc., Ph.D.
C. H. L. Howells, B.Sc., M.D., F.R.C.Path.
D. J. H. Payne, M.B., F.R.C.Path., Dip.Bact.
T. M. Pollock, M.B., M.R.C.P.(Glasg.)
D. Reid, M.B., D.P.H.
Mrs. Joyce D. Coghlan, B.Sc., Ph.D. (*University of Edinburgh*)

Working Party on Farmer's Lung

Chairman and Secretary: (Vacant)

Mrs. C. M. Patricia Bradstreet, M.B., F.R.C.Path., Dip.Bact.
D. G. Davies, M.D., F.R.C.Path., Dip.Bact.
J. E. Jameson, M.R.C.S.
B. Moore, M.D., B.Sc., F.R.C.Path., B.A.O.
H. D. S. Morgan, F.R.C.Path., M.R.C.S., Dip.Bact.
M. Sussman, Ph.D., M.I.Biol. (*The Welsh National School of Medicine, Dept. of Bacteriology*)
D. M. Weir, M.D. (*Department of Bacteriology, Edinburgh University Medical School*)

Working Parties on Acute Respiratory Virus Infections

(Working in collaboration with the Medical Research Council Working Party)

Group I: Acute Respiratory Virus Infections in General Practice

Chairman: P. G. Higgins, M.D., M.R.C.Path., Dip.Bact.

Joint Secretaries:

R. E. Hope-Simpson, O.B.E., F.R.C.G.P., M.R.C.S.
D. L. Miller, M.D., D.P.H.

Group III: Acute Respiratory Virus Infections among Children in Hospital

Chairman, Laboratory Group: J. O'H. Tobin, B.M., M.R.C.Path., Dp.Bact.

Chairman, Clinical Group: Professor S. D. M. Court, M.D., F.R.C.P., D.C.H. (*University of Newcastle*)

Secretary: Miss Pauline M. Poole, M.D., M.R.C.Path., B.A.O., Dip.Bact.

Advisory Committee on Viral Reagents

Chairman: Mrs. C. M. Patricia Bradstreet, M.B., F.R.C.Path., Dip.Bact.

Secretary: Miss E. Margaret Bailey, B.Sc.

Miss Suzanne K. R. Clarke, M.D., M.R.C.Path.
J. V. T. Gostling, M.A., M.B., F.R.C.Path., M.R.C.S.
P. G. Higgins, M.D., M.R.C.Path., Dip.Bact.
Mrs. Margeurite S. Pereira, M.D.
J. O'H. Tobin, B.M., M.R.C.Path., Dp.Bact.
G. B. B. White, M.R.C.S., M.R.C.Path., Dip.Bact.

Committee and Working Party on Whooping Cough

Chairman: E. H. Gillespie, M.B., F.R.C.Path.

Secretary: J. D. Abbott, M.D., M.R.C.Path., Dip.Bact.

Miss Asne H. Antonis, M.B.
H. R. Cayton, M.B., F.R.C.Path.
Miss Lynette M. Dowsett, M.D., F.R.C.Path.
J. V. T. Gostling, M.A., M.B., F.R.C.Path., M.R.C.S.
J. H. Hale, O.B.E., M.D., F.R.C.Path., M.R.C.P.
R. J. Henderson, M.D.
P. G. Higgins, M.D., M.R.C.Path., Dip.Bact.
H. H. Johnston, D.Phil.
L. A. Little, M.B., F.R.C.Path., Dip.Bact.
N. S. Mair, M.B., F.R.C.Path., D.C.H., D.P.H., Dip.Bact.
E. R. Mitchell, M.B., M.R.C.Path., Dip.Bact.
B. Moore, M.D., B.Sc., F.R.C.Path., B.A.O.
D. J. H. Payne, M.B., F.R.C.Path., Dip.Bact.
Mrs. Sheila Polakoff, M.D., D.P.H.
T. M. Pollock, M.B., M.R.C.P.(Glasg.)
Miss Pauline M. Poole, M.D., M.R.C.Path., B.A.O., Dip.Bact.
H. G. M. Smith, M.B., Ph.D., Dip.Bact.
Miss Mair E. M. Thomas, M.B., B.Sc., F.R.C.Path., D.P.H.
Professor Scott Thomson, M.D., F.R.C.P.E., F.R.C.Path., D.P.H.
G. C. Turner, M.D., F.R.C.Path.
J. E. M. Whitehead, M.A., M.B., F.R.C.Path., Dip.Bact.
P. J. Wormald, M.D., F.R.C.Path.
A. E. Wright, T.D., M.D., M.R.C.Path., D.P.H., Dip.Bact.
Professor R. Cruickshank, C.B.E., M.D., F.R.C.P., D.P.H. (17 *Greenhill Gardens, Edinburgh*, 10)
Professor J. P. Duguid, B.Sc., M.D., F.R.C.Path. (*Bacteriology Department, University of St. Andrews*)
W. N. Dunnet, M.D., D.P.H. (*Department of Health and Social Security*)
T. F. Elias-Jones, M.B., F.R.C.Path. (*City Laboratory, Glasgow*)
R. R. Gillies, M.D., M.R.C.Path., D.P.H. (*Bacteriology Department, University of Edinburgh*)
F. T. Perkins, M.Sc., Ph.D. (*Immunological Products Control, Medical Research Council*)
N. W. Preston, M.D., M.R.C.Path., Dip.Bact. (*Department of Bacteriology and Virology, University of Manchester*)
A. F. B. Standfast, M.A., D.Sc., Dip.Bact. (*Vaccine Department, Lister Institute of Preventive Medicine*)
I. Taylor, M.D., F.R.C.P., D.P.H. (22 *Wales Avenue, Carshalton, Surrey*)
J. F. Warin, M.D., D.P.H. (*Medical Officer of Health, City of Oxford*)
A. M. M. Wilson, B.A., B.M., F.R.C.Path. Dip.Bact. (*Bacteriology Department, University of Edinburgh*)

Committee on Infection Risks of Haemodialysis

Chairman and Secretary: B. Moore, M.D., B.Sc., F.R.C.Path., B.A.O.

Miss Yvonne E. Cossart, M.B., B.Sc., M.R.C.Path., D.C.P.
E. H. Gillespie, M.B., F.R.C.Path.
W. H. H. Jebb, M.D., F.R.C.Path.
D. M. Jones, M.D., M.R.C.Path., Dip. Bact.
J. C. Kelsey, M.D., F.R.C.Path., Dip.Bact.
Mrs. Sheila Polakoff, M.D., D.P.H.
G. C. Turner, M.D., F.R.C.Path.
J. R. Ascott, M.B., M.R.C.S., D.O.M.S. (*Department of Health and Social Security*)
J. C. Coleman, M.B., M.R.C.S. (*Fulham Hospital*)
R. G. Mitchell, M.R.C.P., M.R.C.Path. (*Churchill Hospital, Oxford*)

Working Party on Microbiological Specifications for Food

Chairman: Miss Betty C. Hobbs, O.St.J., D.Sc., F.R.C.Path., Dip.Bact.

G. I. Barrow, M.D., M.R.C.Path., Dip.Bact.
H. R. Cayton, M.B., F.R.C.Path.
R. D. Gray, M.D., F.R.C.Path., D.P.H.
R. W. S. Harvey, B.Sc., M.D., F.R.C.Path., Dip.Bact.
R. J. Henderson, M.D.
W. L. Hooper, B.Sc., M.B., M.R.C.Path., Dip.Bact.
H. H. Johnston, D.Phil.
W. F. Lane, M.B., M.Sc., F.R.C.Path., D.P.H.
J. H. McCoy, M.B., D.P.H.
P. G. Mann, M.D., M.R.C.Path., Dip.Bact.
B. Moore, M.D., B.Sc., F.R.C.Path., B.A.O.
L. Robertson, M.A., B.M., F.R.C.Path., Dip.Bact.
A. J. Kingsley Smith, B.M., M.R.C.Path.
H. G. M. Smith, M.B., Ph.D., Dip.Bact.
Miss Mair E. M. Thomas, M.B., B.Sc., F.R.C.Path., D.P.H.
A. T. Willis, M.D., D.Sc., Ph.D., M.R.C.Path., M.R.A.C.P.
A. E. Wright, T.D., M.D., M.R.C.Path., Dip.Bact.

Working Party on Streptococcal Infection in Residential Schools

Chairman: G. B. Ludlam, M.D., F.R.C.Path., D.T.M.&H., D.L.O.
Secretary: D. C. J. Bassett, M.B., Dip.Bact.

Miss Joan M. Boissard, M.R.C.S.
H. R. Cayton, M.B., F.R.C.Path.
J. V. Dadswell, M.B., M.R.C.Path.
C. Dulake, M.B., M.R.C.Path., Dip.Bact.
W. B. Fletcher, A.M.R., F.S.S.
P. K. Fraser, M.D., F.R.C.Path., M.R.C.P.
M. H. Hughes, M.A., D.M., F.R.C.Path., D.T.M.&H., Dip.Bact.
J. G. P. Hutchison, M.D., F.R.C.P. (Glasg.), M.R.C.Path.
L. A. Little, M.B., F.R.C.Path., Dip. Bact.
P. G. Mann, M.D., M.R.C.Path., Dip.Bact.
D. L. Miller, M.D., D.P.H.
G. R. E. Naylor, M.D., M.R.C.P., M.R.C.Path.
M. T. Parker, M.D., F.R.C.Path., Dip.Bact.
Miss Pauline M. Poole, M.D., M.R.C.Path., B.A.O., Dip.Bact.
B. T. Thom, M.B., M.R.C.Path., Dip.Bact.
P. J. Wormald, M.D., F.R.C.Path.
J. C. Gould, M.D., F.R.S.E., F.R.C.P. (Edin.), M.R.C.Path. (*Central Microbiological Laboratory, Edinburgh*)
R. C. Tyldesley, M.B. (*Kingswood Approved School, Bristol*)

Working Party on the Hygiene and Marketing of Fresh Cream

Chairman: R. J. Henderson, M.D.

Secretary: A. E. Wright, T.D., M.D., M.R.C.Path., D.P.H., Dip.Bact.

G. I. Barrow, M.D., M.R.C.Path., Dip.Bact.
G. T. Cook, M.D., F.R.C.Path.
J. M. Croll, M.B., F.R.C.Path., D.P.H.
J. V. Dadswell, M.B., M.R.C.Path.
D. G. Davies, M.D., F.R.C.Path., Dip.Bact.
H. C. Dawkins, F.I.M.L.T.
E. H. Gillespie, M.B., F.R.C.Path.
Miss Betty C. Hobbs, O.St.J., D.Sc., F.R.C.Path., Dip.Bact.
J. G. P. Hutchison, M.D., F.R.C.P. (Glasg.), M.R.C.Path.
Miss Ruth C. J. James, M.B., M.R.C.Path., Dip.Bact.
P. G. Mann, M.D., M.R.C.Path., Dip.Bact.
A. J. Kingsley Smith, B.M., M.R.C.Path.
G. H. Tee, M.R.C.S., Ph.D., F.R.C.Path.
Miss Joan M. Watkinson, B.Sc.
P. J. Wormald, M.D., F.R.C.Path.
W. Shepherd, M.D., M.R.C.Path. (*Bacteriology Laboratory, Belfast City Hospital*)

Standing Committee on Degree Level Diploma in Medical Technology

Chairman: J. C. Kelsey, M.D., F.R.C.Path., Dip.Bact.

C. H. Collins, F.I.M.L.T.
R. A. Quaife, F.I.M.L.T.
G. C. Turner, M.D., F.R.C.Path.
P. J. Wormald, M.D., F.R.C.Path.

Standing Committee on Quality Control

Chairman: R. Blowers, M.D., F.R.C.Path., M.R.C.P., Dip.Bact.

Secretary: J. D. Abbott, M.D., M.R.C.Path., Dip.Bact.

P. B. Crone, M.D., Dip.Bact.
R. D. Gray, M.D., F.R.C.Path., D.P.H.
R. J. C. Hart, M.B., M.R.C.S., M.R.C.Path., Dip.Bact.
M. H. Hughes, M.A., D.M., F.R.C.Path., D.T.M.&H., Dip.Bact.
S. P. Lapage, M.B., M.R.C.Path., Dip.Bact.
J. H. McCoy, M.B., D.P.H.
D. L. Miller, M.D., D.P.H.
C. E. D. Taylor, M.A., M.D., M.R.C.Path., Dip.Bact.
J. D. Whittaker, M.B.E.

Working Party on Hepatitis

Chairman: Miss Yvonne E. Cossart, M.B., B.Sc., M.R.C.Path., D.C.P.

A. D. Evans, M.B., B.Sc., M.R.C.Path., Dip.Bact.
J. V. T. Gostling, M.A., M.B., F.R.C.Path., M.R.C.S.
J. H. Hale, O.B.E., M.D., F.R.C.Path., M.R.C.P.
Mrs. Sheila Polakoff, M.B., D.P.H.
G. C. Turner, M.D., F.R.C.Path.
T. H. Flewett, M.D., F.R.C.Path. (*Regional Virus Laboratory, Birmingham*)
F. O. MacCallum, M.D., F.R.C.Path. (*Virology Department, Radcliffe Infirmary, Oxford*)

Working Party on Safety Requirements for the Installation and Operation of Centrifuges

Chairman: M. T. Parker, M.D., F.R.C.Path., Dip.Bact.

Miss Joan R. Davies, M.D., Dip.Bact.
J. C. Kelsey, M.D., F.R.C.Path., Dip.Bact.
O. M. Lidwell, D.Phil.
A. Waltho

APPENDIX II

PUBLICATIONS BY MEMBERS OF THE STAFF OF THE PUBLIC HEALTH LABORATORY SERVICE DURING 1970

Besides the specific items mentioned below, there are many publications to which the work of the Service has contributed. The internationally recognised reference laboratories and the Epidemiological Research Laboratory submit figures regularly to W.H.O. for inclusion in their statistical periodicals. Again, the giving of specialist help and advice and the supply of serological reagents are among the functions of the Service, and in the course of the year a number of papers have acknowledged such contributory work by members of the staff. Other unlisted material includes leading articles, unsigned annotations, conference papers which remain unpublished, book reviews, contributions to the various abstracting journals, and notes compiled from the Service's weekly Communicable Disease Report which appear regularly in the Brit. med. J. *and elsewhere.*

ABBOTT, J. D., ADAMS, D. and COLLINS, T. J. Sensitivity of meningococci to sodium sulphadiazine and six antibiotics. *J. med. Microbiol.*, 1970, **3**, 233.

ANDERSON, E. S. [Contributions to discussion.] In: *Aspects of infective drug resistance: report of the proceedings of the symposium at the Royal Society of Medicine*, edited by A. T. Mennie. London, PMP Services Ltd., 1970, p. 50 *et seq.*

ANDERSON, E. S. Résistance transférable aux antibiotiques. In: *Actualités thérapeutiques. Comptes rendus: journées médicales, Mai 1969.* Société de Médecine de Charleroi, 1970, p. 33.

ANDERSON, E. S. Use of broad-spectrum antibiotics. [Letter,] *Brit. med. J.*, 1970, **iii**, 225.

ANDERSON, E. S. and THRELFALL, E. J. Change of host range in a resistance factor. *Genet. Res.*, 1970, **16**, 207.

ANDREWS, B. E. Problems of a national mycoplasma reference laboratory. In: *Mycoplasma diseases of man* (*Proc. int. Symp., Reinhardsbrunn Castle, 1968*), edited by M. Sprössig & W. Witzleb. Jena, Fischer, 1969, p. 11.

ANDREWS, B. E., JURMANOVÁ K. and LEACH, R. H. The classification of mycoplasmas. *Publ. Fac. Sci. Univ. J. E. Purkyně, Brno*, 1970, **47**, 73.

ANDREWS, B. E. and LEACH, R. H. The WS7 strain of *Mycoplasma gallisepticum.* [Letter.] *Vet. Rec.*, 1970, **86**, 789.

ANTONIS, Asne H. Isolation of *Bordetella pertussis* from pernasal swabs stored in Stuart's transport medium. *J. med. Microbiol.*, 1970, **3**, 184.

APLEY, J., CLARKE, S. K. R., ROOME, A. P. C. H., SANDRY, S. A., SAYGI, G., SILK, B. and WARHURST, D. C. Primary amoebic meningoencephalitis in Britain. *Brit. med. J.*, 1970, **i**, 596.

ARYA, O. P., PEARSON, C. H., RAO, S. K. and BLOWERS, R. Treatment of gonorrhoea with trimethoprim-sulphamethoxazole in Uganda. *Brit. J. vener. Dis.*, 1970, **46**, 214.

ASHESHOV, Elizabeth H. Extrachromosomal genes in bacteria: essay review. *Chem. & Ind.*, 1970, p. 765.

ASHESHOV, Elizabeth H. The genetics of penicillinase production in *Staphylococcus aureus* strain PS80. *J. gen. Microbiol.*, 1969, **59**, 289.

ASHESHOV, Elizabeth H., WOODS, J. M. and DYKE, K. G. H. Penicillinase synthesis in *Staphylococcus aureus*: the effect of inducer and of the cellular location of the genetic determinants on the amount of enzyme formed. *Genet. Res.*, 1970, **16**, 95.

Ashton, W. L. G., Boardman, P. L., D'Sa, C. J., Everall, P. H. and Houghton, A. W. J. Human fascioliasis in Shropshire. *Brit. med. J.*, 1970, **iii**, 500.

Barrow, G. I. and Ellis, C. Direct microscopical examination of tube cultures for the detection of trichomonads. *J. clin. Path.*, 1970, **23**, 91.

Bartlett, D. I. The survival of bacteria on swabs. *Lab. Med.*, 1970, **1**, No. 7, 32.

Barton, B. W. and Tobin, J. O'H. The effect of idoxuridine on the excretion of cytomegalovirus in congenital infection. *Ann. N.Y. Acad. Sci.*, 1970, **173**, 90.

Bassett, D. C. J. *Hippelates* flies and streptococcal skin infection in Trinidad. *Trans. R. Soc. trop. Med. Hyg.*, 1970, **64**, 138.

Bassett, D. C. J., Stokes, K. J. and Thomas, W. R. G. Contamination of disinfectant solutions. [Letter.] *Lancet*, 1970, **ii**, 218.

Bassett, D. C. J., Stokes, K. J. and Thomas, W. R. G. Wound infection with *Pseudomonas multivorans*, a water-borne contaminant of disinfectant solutions. *Lancet*, 1970, **i**, 1188.

Bellamy, G. A simple biological freezer for use with wide-necked liquid nitrogen refrigerators *J. med. Lab. Tech.*, 1970, **27**, 154.

Bettelheim, K. A. and Taylor, J. Soluble antigens of enteropathogenic *Escherichia coli. J. med. Microbiol.*, 1970, **3**, 655.

Blake, Jean M. The establishment of continuous cell lines from Burkitt's lymphoma and infectious mononucleosis: their use in studies on infectious mononucleosis. *University of London, M.Phil. Thesis*, 1970.

Blowers, R. Hospital infection. *Community Hlth*, 1970, **1**, 337.

Blowers, R. Note on bacteriology. In: *Paratyphoid fever: community aspects of an outbreak in Teesside during the autumn of 1969*, by R. J. Donaldson. Middlesbrough, Teesside Health Department, 1970, p. 17.

Boucher, D. W., Melnick, J. L., Craske, J., Burkhardt, M., Seelig, S. and Boggs, J. D. Interfering agent in specimens from patients with infectious hepatitis. *Bact. Proc.*, 1970, p. 177.

Bradstreet, C. M. Patricia, Tannahill, A. J., Pollock, T. M. and Mogford, H. E. Intradermal test and serological tests in suspected brucella infection in man. *Lancet*, 1970, **ii**, 653.

Brandish, Judith M. and Willis, A. T. Observations on the coagulase and deoxyribonuclease tests for staphylococci. *J. med. Lab. Tech.*, 1970, **27**, 355.

Bullin, C. H., Tanner, E. I. and Collins, C. H. Isolation of *Mycobacterium xenopei* from water taps. *J. Hyg., Camb.*, 1970, **68**, 97.

Caird, G. R., Wilson, R. S. E., Caul, E. O. and Perham, T. G. M. Herpes infection after transplantation. [Letter.] *Brit. med. J.*, 1970, **iii**, 403.

Candeias, J. A. N. and Pereira, M. S. Pesquisa de anticorpos para o virus EB em adultos e crianças. *Rev. Inst. Med. trop. S. Paulo*, 1970, **12**, 333.

Carpenter, K. Patricia. Drugs for dysentery. [Letter.] *Brit. med. J.*, 1970, **ii**, 235.

Cartwright, R. Y. and Hargrave, P. R. Pseudomonas in ventilators. [Letter.] *Lancet*, 1970, **i**, 40.

Casemore, D. P. Sensitivity of hartmannella (acanthamoeba) to 5-fluorocytosine, hydroxystilbamidine and other substances. *J. clin. Path.*, 1970, **23**, 649.

Chakraverty, Pratima. The antigenic relationships between influenza B viruses. *University of Reading, M.Phil. Thesis*, 1970.

Chessum, B. S. Examination of sera for toxoplasmosis antibody using immunofluorescence. *J. med. Lab. Tech.*, 1970, **27**, 49.

Cooke, E. Mary, Shooter, R. A., O'Farrell, S. M. and Martin, D. R. Faecal carriage of *Pseudomonas aeruginosa* by newborn babies. *Lancet*, 1970, **ii**, 1045.

Cossart, Yvonne E. Some data about Australia antigen (HAA) in Great Britain. *Vox Sang.*, 1970, **19** ,404.

Cossart, Yvonne E. and Field, A. M. Virus-like particles in serum of patients with Australia-antigen-associated hepatitis. [Letter.] *Lancet*, 1970, **i**, 848.

Cossart, Yvonne E. and Vahrman, J. Studies of Australia-SH antigen in sporadic viral hepatitis in London. *Brit. med. J.*, 1970, **i**, 403.

Cradock-Watson, J. E., Hutchinson, D. N. and Tobin, J. O'H. The isolation of enteroviruses in the Manchester area 1963–67. *XII Europ. Symp. Polio., Bucharest, 1969*, p. 349.

Craven, J. L., Pugsley, D. J. and Blowers, R. Trimethoprim-sulphamethoxazole in acute osteomyelitis due to penicillin-resistant staphylococci in Uganda. *Brit. med. J.*, 1970, **iii**, 201.

Crone, P. B. and Lee, E. M. Proportion of tubercle bacilli resistant to drugs in an isolate. *Amer. Rev. resp. Dis.*, 1970, **101**, 629.

Dadd, A. H., Dagnall, V. P., Everall, P. H. and Jones, A. C. The survival of *Streptococcus pyogenes* on bacteriological swabs made from various fibres. *J. med. Microbiol.*, 1970, **3**, 561.

Davies, Joan R., Farrant, W. N. and Uttley, A. H. C. Antibiotic resistance of *Shigella sonnei. Lancet*, 1970, **ii**, 1157.

Dighero, Mabel W., Bradstreet, C. M. P. and Andrews, B. E. Dried paper discs for serological identification of human mycoplasmas. *J. appl. Bact.*, 1970, **33**, 750.

Donovan, T. J. *Klebsiella ozaenae*, capsule type 4. *J. med. Lab. Tech.*, 1970, **27**, 72.

Dyke, K. G. H., Parker, M. T. and Richmond, M. H. Penicillinase production and metal-ion resistance in *Staphylococcus aureus* cultures isolated from hospital patients. *J. med. Microbiol.*, 1970, **3**, 125.

Edwards, Joan M. B., Tannahill, A. J. and Bradstreet, C. M. P. Comparison of the indirect fluorescent antibody test with agglutination, complement-fixation, and Coombs tests for brucella antibody. *J. clin. Path.*, 1970, **23**, 161.

Eldridge, A. E., Jones, D. M. and Tobin, B. M. Antibody to *Mycoplasma hominis* in patients with respiratory disease. *J. clin. Path.*, 1970, **23**, 664.

Elwood, W. J., Abbott, J. D., Blackbourn, M. S. and Hughes, M. An outbreak of *Salmonella virchow* food poisoning amongst hospital staff, with experimental evidence on the cooking of chicken. *Med. Offr*, 1970, **123**, 273.

Everall, P. H. The double diffusion precipitin test in human fascioliasis. *J. clin. Path.*, 1970, **23**, 636.

Fletcher, S. M., Rondle, C. J. M. and Murray, I. G. The extracellular antigens of *Micropolyspora faeni*: their significance in farmer's lung disease. *J. Hyg., Camb.*, 1970, **68**, 401.

Geddes, A. M., Bridgwater, F. A. J., Williams, D. N., Oon, J. and Grimshaw, G. J. Clinical and bacteriological studies with clindamycin. *Brit. med. J.*, 1970, **ii**, 703.

Gilbert, R. J. Comparison of materials used for cleaning equipment in retail food premises, and of two methods for the enumeration of bacteria on cleaned equipment and work surfaces. *J. Hyg., Camb.*, 1970, **68**, 221.

Gillespie, E. H. Whooping cough immunization. [Letter.] *Brit. med. J.*, 1970, **i**, 366.

Goodwin, C. S., Gostling, J. V. T., Pead, P. J. and Sims, E. H. Genital herpes. [Letter.] *Brit med. J.*, 1970, **iv**, 558.

Goodwin, C. S., Parsons, B. and Haskett, C. Urine, boric acid, and osmolality. [Letter.] *Lancet*, 1970, **ii**, 1320.

Goodwin, C. S. and Wood, M. J. Bacteria isolated from plantar ulcers of Ethiopian leprosy patients, with the antibacterial drug sensitivities of the isolates. *Trans. R. Soc. trop. Med. Hyg.*, 1970, **64**, 421.

Goodwin, C. S. and Wood, M. J. The use of flufenamic acid in acute complications of leprosy, and the associated lowering of raised serum transaminase levels. *Int. J. Leprosy*, 1970, **38**, 68.

Gourlay, R. N. and Leach, R. H. A new mycoplasma species isolated from pneumonic lungs of calves (*Mycoplasma dispar* sp. nov.). *J. med. Microbiol.*, 1970, **3**, 111.

Gratzer, W. B., Hill, L. R. and Owen, R. J. Circular dichroism of DNA. *Europ. J. Biochem.*, 1970, **15**, 209.

Greaves, P. W. A simplified technique for the identification of coliform bacilli. *J. med. Lab. Tech.*, 1970, **27**, 190.

Grindley, June N., Grindley, N. D. F. and Anderson, E. S. Acridine treatment of F+ and Hfr strains of *Escherichia coli* K12 carrying a neomycin-kanamycin resistance determinant. *Genet. Res.*, 1970, **15**, 327.

Grob, P. R., Manners, B. T. B. and Dulake, C. A survey of urinary-tract infection in a general practice. *Practitioner*, 1970, **204**, 567.

Hale, J. H. and Selkon, J. B. Multiply resistant staphylococci. [Letter.] *Lancet*, 1970, **ii**, 528.

Hall, Mary L. M. and Taylor, J. *Salmonella dublin:* the relation between a living calf vaccine strain and those isolated from human and other sources. *Vet. Rec.*, 1970, **86**, 534.

Hambling, M. H. Diagnostic virology. *Hlth Notes, Wakefield*, 1970, **3**, 30.

Harbourne, J. F., Luery, K. W., Wallace, J. G. and Threlkeld, J. M. Farmer's lung hay antibodies in cattle. [Letter.] *Vet. Rec.*, 1970, **87**, 559.

Hargreaves, F. D. and Leach, R. H. The influence of mycoplasma infection on the sensitivity of HeLa cells for growth of viruses. *J. med. Microbiol.*, 1970, **3**, 259.

Harvey, R. W. S. and Price, T. H. Salmonellosis in South Wales. *Publ. Hlth, Lond.*, 1970, **84**, 183.

Harvey, R. W. S. and Price, T. H. Sewer and drain swabbing as a means of investigating salmonellosis. *J. Hyg., Camb.*, 1970, **68**, 611.

Henderson, R. J. Brucellosis. [Letter.] *The Times*, 1 January 1970, p. 11.

Henderson, R. J. Summary of recent abstracts. VI. Plague. *Trop. Dis. Bull.*, 1970, **67**, 745.

Higgins, P. G. Hand, foot and mouth disease due to Coxsackie A viruses. *Chiropodist*, 1970, **25**, 165.

Higgins, P. G., Ellis, E. M., Woolley, D. A. and Cassidy, P. F. Viruses associated with acute respiratory infections in Royal Air Force personnel. *J. Hyg., Camb.*, 1970, **68**, 647.

Hill, L. R. and Lapage, S. P. The DNA base compositions and taxonomy of *Bacteroides corrodens* and *Cardiobacterium hominis*. *Publ. Fac. Sci. Univ. J. E. Purkyně, Brno*, 1970, **47**, 85.

Hill, L. R., Leach, R. H. and Andrews, B. E. The value of DNA base composition determinations in the classification of some atypical mycoplasmas. *Publ. Fac. Sci. Univ. J. E. Purkyně, Brno*, 1970, **47**, 79.

Hill, L. R., Snell, J. J. S. and Lapage, S. P. Identification and characterisation of *Bacteroides corrodens*. *J. med. Microbiol.*, 1970, **3**, 483.

Hill, M. N., Varma, M. G. R., Mahadevan, S. and Meers, P. D. Arbovirus infections in Sarawak: observations on mosquitoes in the premonsoon period, September to December 1966. *J. med. Ent.*, 1969, **6**, 398.

Hipp, S. S., Berns, D. S., Tompkins, V. and Buckley, H. R. Latex slide agglutination test for aspergillus antibodies. *Sabouraudia*, 1970, **8**, 237.

Hobbs, Betty C. Raw meats. In: *Proceedings of the Mildred Galton Memorial Conference of the I.A.M.S. International Committee on Microbiological Specifications for Foods, Dubrovnik, 1969*, 1970, p. 100.

Hobbs, Betty C. Safety and quality: microbiological. In: *Proceedings: symposium on feeding the military man, Natick, Mass., 1969*, edited by M. S. Peterson. Washington, National Academy of Sciences, National Research Council, 1970, p. 148.

Hobbs, Betty C. and Gilbert, R. J. Microbiological standards for food: public health aspects. *Chem. & Ind.*, 1970, p. 215.

Hope-Simpson, R. E. Acute respiratory infections. I. Epidemiology. *Update*, 1970, **2**, 1207.

Hope-Simpson, R. E. First outbreak of Hong Kong influenza in a general practice population in Great Britain: a field and laboratory study. *Brit. med. J.*, 1970, **iii**, 74.

Howie, *Sir* James. Bacteriological checks on food handlers. [Letter.] *Brit. med. J.*, 1970, **ii**, 420.

Howie, *Sir* James. Democratic direction. *Brit. med. J.*, 1970, **iv**, 793.

Howie, *Sir* James. Otitis externa and food handlers. *Practitioner*, 1970, **204**, 687.

Howie, *Sir* James. Postgraduate medical degrees. [Letter.] *Scot. med. J.*, 1970, **15**, 421.

Howie, *Sir* James. Training of epidemiologists for control of communicable diseases. *Proc. R. Soc. Med.*, 1970, **63**, 519.

Howie, *Sir* James. Where does medicine stand? *Publ. Hlth, Lond.*, 1970, **85**, 6.

Hughes, M. H. Doctors' pensions. [Letter.] *Brit. med. J.*, 1970, **iv**, 806.

Hughes, M. H. Spoons and dip-slides. [Letter.] *Lancet*, 1970, **ii**, 420.

Ingham, H. R., Selkon, J. B., Codd, A. A. and Hale, J. H. The effect of carbon dioxide on the sensitivity of *Bacteroides fragilis* to certain antibiotics in vitro. *J. clin. Path.*, 1970, **23**, 254.

Inglis, J. M., Davies, J. and Andrews, B. E. On the comparative mycoplasma flora of the upper and lower respiratory tract of man. In: *Mycoplasma diseases of man* (*Proc. int. Symp., Reinhardsbrunn Castle, 1968*), edited by M. Sprössig and W. Witzleb. Jena, Fischer, 1969, p. 125.

Jacobs, S. I., Holzel, A., Wolman, B., Keen, J. H., Miller, V., Taylor, J. and Gross, R. J. Outbreak of infantile gastro-enteritis caused by *Escherichia coli* 0114. *Arch. Dis. Childh.*, 1970, **45**, 656.

Jarvis, K. J. and Scrimgeour, G. In-vitro sensitivity of *Shigella sonnei* to trimethoprim and sulphamethoxazole. *J. med. Microbiol.*, 1970, **3**, 554.

Jephcott, A. E. and Reyn, A. Gonococcal colony appearances. WHO/VDT/RES/GON/70.40, 1970. [Wld Hlth Org. working document.]

Jevons, M. Patricia. Bacteriology. I. The uses of bacteriology. II. Bacteriological investigation of upper respiratory tract infections. III. Urinary tract infections. IV. Examination of gastro-intestinal infections. V. Bacteriological investigation of genital tract infections. *Update*, 1969, **1**, 1178, 1282; 1970, **2**, 76, 245, 373. Bacteriological investigation of miscellaneous specimens. *ibid.*, 1970, **2**, 497. Guide to bacteriological investigations. *ibid.*, 1970, **2**, 903.

Jevons, M. Patricia. Use of broad-spectrum antibiotics. [Letter.] *Brit. med. J.*, 1970, **ii**, 540.

Jones, D. M. Disinfectants in hospitals. *Hosp. Mgmt Plan. Equipm.*, 1970, **33**, 138.

Jones, D. M. Mycoplasma infections of the genital tract. In: *Mycoplasma diseases of man* (*Proc. int. Symp., Reinhardsbrunn Castle, 1968*), edited by M. Sprössig and W. Witzleb. Jena, Fischer, 1969, p. 135.

Jones, D. M. Mycoplasma and the urogenital tract. [Letter.] *Lancet*, 1970, **ii**, 474.

Jones, D. M., Tobin, B. M., Harlow, G. R. and Ralston, A. J. Bacteriological studies of the modified Kiil dialyser. *Brit. med. J.*, 1970, **iii**, 135.

Kelsey, J. C. Choosing appropriate disinfectants—a challenge. *Hlth Trends*, 1970, **2**, 72.

Kelsey, J. C. Disinfectants for hospital use: an interim statement. *Brit. Hosp. J. soc. Serv. Rev.*, 1970, **80**, 521.

Lapage, S. P. Identification services in the National Collection of Type Cultures. *Proc. I int. Conf. Culture Collect., Tokyo, 1968*, Univ. Tokyo Press, 1970, p. 171.

Lapage, S. P. The National Collection of Type Cultures, Colindale, London. *Proc. I. int. Conf. Culture Collect., Tokyo, 1968*, Univ. Tokyo Press, 1970, p. 11.

Lapage, S. P. National Collection of Type Cultures: culture collection management. *Proc. I int. Conf. Culture Collect., Tokyo, 1968*, Univ. Tokyo Press, 1970, p. 212.

Lapage, S. P., Bascomb, S., Willcox, W. R. and Curtis, M. A. Computer identification of bacteria. In: *Automation, mechanization and data handling in microbiology* (*Soc. appl. Bact. tech. Ser. No. 4*), edited by A. Baillie and R. J. Gilbert. London, Academic Press, 1970, p. 1.

Lapage, S. P., Shelton, J. E. and Mitchell, T. G. Media for the maintenance and preservation of bacteria. In: *Methods in microbiology* **3A**, edited by J. R. Norris and D. W. Ribbons. London, Academic Press, 1970, p. 1.

Lapage, S. P., Shelton, J. E., Mitchell, T. G. and Mackenzie, A. R. Culture collections and the preservation of bacteria. In: *Methods in microbiology* **3A**, edited by J. R. Norris and D. W. Ribbons. London, Academic Press, 1970, p. 135.

Leach, R. H. The occurrence of *Mycoplasma arginini* in several animal hosts. [Letter.] *Vet. Rec.*, 1970, **87**, 319.

Leach, R. H. and Hargreaves, F. D. The influence of different mycoplasma species on the growth of several viruses in tissue culture. In: *Mycoplasma diseases of man* (*Proc. int. Symp., Reinhardsbrunn Castle, 1968*), edited by M. Sprössig and W. Witzleb. Jena, Fischer, 1969, p. 179.

Leat, J. L. and Marks, J. Improvement of drug-sensitivity tests on tubercle bacilli. *Tubercle Lond.*, 1970, **51**, 68.

Le Minor, L. avec la collaboration de J. Taylor et R. Rohde. Supplément N⁰ XIII au schéma de Kauffmann-White. *Ann. Inst. Pasteur*, 1970, **119**, 438.

Le Minor, L., Rohde, R. and Taylor, J. Nomenclature des salmonella. *Ann. Inst. Pasteur*, 1970, **119**, 206.

Lewis, M. J. Transferable antibiotic resistance in bacteria. *University of Bristol, M.D. Thesis*, 1970.

Ley, F. J., Kennedy, T. S., Kawashima, K., Roberts, D. and Hobbs, B. C. The use of gamma radiation for the elimination of salmonella from frozen meat. *J. Hyg., Camb.*, 1970, **68**, 293.

Lidwell, O. M. Mikroorganismer, levende stof i luften. In: *Termisk og atmosfaerisk indeklima*, edited by N. Jonassen. Copenhagen, Polyteknisk Forlag, 1970, p. 481.

Lidwell, O. M., Polakoff, S., Davies, J., Hewitt, J. H., Shooter, R. A., Walker, K. A. Gaya, H. and Taylor, G. W. Nasal acquisition of *Staphylococcus aureus* in a subdivided and mechanically ventilated ward: endemic prevalence of a single staphylococcal strain. *J. Hyg., Camb.*, 1970, **68**, 417.

Lidwell, O. M. and Towers, A. G. Uni-directional flow ventilation in patient isolation. In: *Aerobiology: proceedings of the third international symposium, 1969*, edited by I. H. Silver. London, Academic Press, 1970, p. 109.

Lowbury, E. J. L., Thom, B. T., Lilly, H. A. Babb,, J. R. and Whittall, K. Sources of infection with *Pseudomonas aeruginosa* in patients with tracheostomy. *J. med. Microbiol.*, 1970, **3**, 39.

McDowall, M. F., Ramkissoon, R. and Bassett, D. C. J. Epidemic and endemic pattern of childhood nephritis: pathogenesis, epidemiology and clinical course of outbreaks in Trinidad. *Clin. Pediat.*, 1970, **9**, 580.

Macrae, A. D. Rabies. *Hlth Trends*, 1970, **2**, 58.

Macrae, A. D. Rabies vaccines. [Letter.] *Lancet*, 1970, **i**, 1229.

Macrae, A. D. Treatment of rabies. [Letter.] *Brit. med. J.*, 1970, **iii**, 167.

Macrae, A. D. Viraemia in rabies. [Letter.] *Lancet*, 1970, **i**, 299.

Macrae, A. D. and Reid, D. Rubella and pregnancy. [Letter.] *J. R. Coll. gen. Practit.*, 1970, **20**, 49.

McSwiggan, D. A. and George, R. A comparison of two cell culture systems for the primary isolation of enteric viruses. *Bull. World Hlth Org.*, 1970, **43**, 295.

Mair, N. S., Schubert, F. K. and Harbourne, J. F. *Yersinia enterocolitica* in the bush baby (Galago). *Vet. Rec.* 1970, **86**, 69.

Mann, P. G. *Corynebacterium ulcerans* infections. [Letter.] *Lancet*, 1970, **i**, 839.

Mann, P. G. Disposable pillow cases. *Brit. Hosp. J. soc. Serv. Rev.*, 1970, **80**, 1641.

Mann, P. G. and Sandys, G. H. Detection of bacteriuria. [Letter.] *Lancet*, 1970, **ii**, 473.

Manners, B. T. B., Dulake, C. and Grob, P. R. Urinary tract infection in women: a study from general practice. *J. R. Coll. gen. Practit.*, 1970, **19**, 343.

Marks, J. New mycobacteria. *Hlth Trends*, 1970, **2**, 68.

Marks, J. Sensitivity tests in tuberculosis. [Letter.] *Brit. med. J.*, 1970, **iii**, 707.

Midgley, Jenifer, Lapage, S. P., Jenkins, B. A. G., Barrow, G. I., Roberts, M. E. and Buck, A. G. *Cardiobacterium hominis* endocarditis. *J. med. Microbiol.*, 1970, **3**, 91.

Miller, D. L. Communicable disease. In: *Data handling in epidemiology*, edited by W. W. Holland. London, Oxford University Press, 1970, p. 15.

Miller, D. L. The prophylactic and therapeutic uses of immunoglobulin in virus infections. In: *Modern trends in medical virology* **2**, edited by R. B. Heath and A. P. Waterson. London, Butterworths, 1970, p. 284.

Miller, D. L., Reid, D. and Diamond, J. R. Poliomyelitis surveillance in England and Wales, 1965–8. *Publ. Hlth, Lond.*, 1970, **84**, 265.

Mitchell, N. J. A simplified method for quantitative microbiological examination of deep frozen seafoods. *J. appl. Bact.*, 1970, **33**, 523.

Moore, B. The infection control sister in British hospitals. *Int. Nurs. Rev.*, 1970, **17**, 84.

Moore, B. The present status of diseases connected with marine pollution. *Rev. int. Océanogr. méd.*, 1970, **18/19**, 193.

Moore, B. Problems of a haemodialysis unit. [Abstract.] *Brit. Hosp. J. soc. Serv., Rev.*, 1970, **80**, 1939.

Moore, B. Public health aspects. *Proc. Symp. Wat. Pollut. Control coastal Areas, Bournemouth, 1970*, Institute of Water Pollution Control, 1970, p. 22.

Morris, C. A., Boxall, F. N. and Cayton, H. R. Genital tract tuberculosis in subfertile women. *J. med. Microbiol.*, 1970, **3**, 85.

Murray, I. G. Aspergillosis. *V int. Congr. infect. Dis., Vienna, 1970*, 1970, **4**, 25.

Murray, I. G., Buckley, H. R. and Turner, G. C. Precipitins to *Candida* species after open heart surgery. [Abstract.] *Antonie van Leeuwenhoek*, 1969, **35**, Suppl., p. E17.

Murray, I. G. and Mahgoub, E. S. Treatment of nocardiosis. [Letter.] *Lancet*, 1970, **ii**, 362.

Nagington, J. Chronic carriage of Australia antigen without symptoms after renal transplant. *Brit. med. J.*, 1970, **iv**, 409.

Naylor, G. R. E. Bacteria and the skin. In: *An introduction to the biology of the skin*, edited by R. H. Champion, T. Gillman, A. J. Rook and R. T. Sims. Oxford, Blackwell, 1970, p. 197.

Noone, P., Griffiths, R. J. and Taylor, C. E. D. Hexachlorophane for treating carriers of *Staphylococcus aureus*. *Lancet*, 1970, **i**, 1202.

Oller, L. Z. and Smith, H. G. M. Anti-gonococcal activity of cephalexin (preliminary laboratory and clinical results). In: *Proceedings of a symposium on the clinical evaluation of cephalexin, London, 1969*, edited by R. D. Foord. Greenford, Glaxo Laboratories, 1969, p. 51.

Oller, L. Z., Smith, H. G. M. and Marshall, M. J. Cephaloridine and cephalexin in venereological practice. *Postgrad. med. J.*, 1970, **46**, Oct. Suppl., p. 99.

Parker, M. T. and Hewitt, J. H. Methicillin resistance in *Staphylococcus aureus*. *Lancet*, 1970, **i**, 800.

Payne, D. J. H. [Contributions to discussion.] In: *Aspects of infective drug resistance: report of the proceedings of the symposium at the Royal Society of Medicine*, edited by A. T. Mennie. London, PMP Services Ltd., 1970, p. 55 *et seq.*

Payne, D. J. H. Medical opinion on antibiotics in agriculture. In: *Factory farming*, edited by J. R. Bellerby. London, Education Services, 1970, p. 25.

Peard, Mary C., Fleck, D. G., Garrod, L. P. and Waterworth, P. M. Combined rifampicin and erythromycin for bacterial endocarditis. *Brit. med. J.*, 1970, **iv**, 410.

Pennington, J. H. The polymyxins, bacitracin, novobiocin and vancomycin. *Med. Today, Karachi*, 1970, **4**, 41.

Pereira, Marguerite S. and Candeias, J. A. N. The association of viruses with clinical pertussis. *Abstr. X int. Congr. Microbiol., México, D.F., 1970*, 1970, p. 176.

Perkins, F. T., Sheffield, F., Miller, C. L. and Skegg, J. L. The comparison of toxicity o pertussis vaccines in children and mice. In: *International symposium on pertussis, Bilthoven, 1969* (*Symp. Ser. immunobiol. Standard*, No. 13). Basel, Karger, 1970, p. 141.

PETHER, J. V. S., CLARE, D. E. and BEASLEY, J. An outbreak of infectious hepatitis in a village school, controlled with human immunoglobulin. *Med. Offr*, 1970, **124**, 165.

PHILLIPS, I., MIDGLEY, J. and LAPAGE, S. P. Endocarditis due to a *Pasteurella multocida*-like organism. *E. Afr. med. J.*, 1970, **47**, 440.

PITT, T. L. and DEY, D. A method for the detection of gelatinase production by bacteria. *J. appl. Bact.*, 1970, 33, 687.

PITTON, J. S. and ANDERSON, E. S. The inhibitory action of transfer factors on lysis of *Escherichia coli* K12 by phages μ2 and φ2. *Genet. Res.*, 1970, **16**, 215.

POLAKOFF, Sheila. [Contribution to discussion.] In: *International symposium on pertussis, Bilthoven, 1969* (*Symp. Ser. immunobiol. Standard.*, No. 13). Basel, Karger, 1970, p. 24.

POLLOCK, T. M. Assessing immunisation procedures. *Proc. R. Soc. Med.*, 1970, **63**, 811.

POLLOCK, T. M. [Contribution to] discussion on immunization programmes in general practice. *Practitioner*, 1970, **204**, 716.

POLLOCK, T. M. Organisation of field trials of vaccines in England, with special reference to measles vaccine. *Anglo-Germ. med. Rev.*, 1969, **5**, 9.

PRAKASH, A., CHALMERS, J. A., ONOJOBI, O. I. A., HENDERSON, R. J. and CUMMINGS, P. Transfer of limecycline and cephaloridine from mother to fetus: a comparative study. *J. Obstet. Gynaec. Brit. Commonw.*, 1970, **77**, 247.

PRICE, T. H. and MORGAN, J. Can bacteriologists agree? [Letter.] *Lancet*, 1970, **i**, 1117.

REID, D. Poliomyelitis in England and Wales (1967–1968). *XII Europ. Symp. Polio., Bucharest, 1969*, p. 29.

REID, D., MACRAE, A. D., VANDERVELDE, E. M. and GRIFFITHS, G. I. T. Rubella in a residential community. *Publ. Hlth, Lond.*, 1970, **84**, 136.

REID, D., YETTS, R., ODDY, C. G. and BENSON, P. F. Poliomyelitis antibody titres in children and the effect of live and killed poliovaccine. *XII Europ. Symp. Polio., Bucharest, 1969*, p.165.

REYN, Alice, JEPHCOTT, A. E. and RAVN, H. Gonococcal colony appearances II. WHO/VDT/RES/GON/70.45, 1970. [Wld Hlth Org. working document.]

RICE, N. S. C., DUNLOP, E. M. C., JONES, B. R., HARE, M. J., KING, A. J., RODIN, P., MUSHIN, A. and WILKINSON, A. E. Demonstration of treponeme-like forms in cases of treated and untreated late syphilis and of treated early syphilis. *Brit. J. vener. Dis.*, 1970, **46**, 1.

RINALDI, A., LEACH, R. H., CERVIO, G., MANDELLI, G. and REDAELLI, G. Isolamento ed identificazione di micoplasmi da vitelli con alterazione polmonari. *Atti Soc. ital. Sci. vet.*, 1969, **23**, 1001.

ROBERTSON, L., HUTCHINSON, D. N. and TOBIN, J. O'H. Paralytic disease with viruses other than poliovirus. *XII Europ. Symp. Polio., Bucharest, 1969*, p. 329.

ROSS, Helen. Metronidazole in toxoplasmosis. [Letter.] *Trans. R. Soc. trop. Med. Hyg.*, 1970, **64**, 313.

ROWE, B., TAYLOR, J. and BETTELHEIM, K. A. An investigation of travellers' diarrhoea. *Lancet*, 1970, **i**, 1.

SCHWÖBEL, W. and LEACH, R. H. Eine *Mycoplasma laidlawii* nahestehende Mycoplasmenart aus primären Kälbernierenkulturen. *Zbl. Bakt., I Abt. Orig.*, 1970, **214**, 495.

SETH, A. Use of trimethoprim to prevent overgrowth by proteus in the cultivation of *N. gonorrhoeae*. *Brit. J. vener. Dis.*, 1970, **46**, 201.

SEVILLE, R. H., RAO, P. S., HUTCHINSON, D. N. and BIRCHALL, G. Outbreak of Campbell de Morgan spots. *Brit. med. J.*, 1970, **i**, 408.

SHANNON, R. and HEDGES, A. J. A colorimetric bioassay method for colicins. *J. appl. Bact.*, 1970, **33**, 555.

SKIRROW, M. B. and PRAKASH, A. Tubo-ovarian abscess caused by a non-capsulated strain of *Haemophilus influenzae*. *Brit. med. J.*, 1970, **i**, 32.

SMITH, H. R., GRINDLEY, J. N., GRINDLEY, N. D. F. and ANDERSON, E. S. Derepression of F-*lac* in *Salmonella typhimurium* by a determinant for kanamycin resistance. *Genet. Res.*, 1970, **16**, 349.

Smith, Christine, Anderson, E. S. and Clowes, R. Stable, composite molecular forms of an R factor. *Bact. Proc.*, 1970, p. 60.

Steede, F. D. F. and Wormald, P. J. Influenza vaccination. [Letter.] *Brit. med. J.*, 1970, **iii**, 708.

Stevenson, J., Mandal, B. K. and Hambling, M. H. The influenza epidemic. [Letter.] *Brit. med. J.*, 1970, **i**, 429.

Stewart, C. J., Dixon, J. M. S. and Curtis, B. A. Isolation of mycobacteria from tonsils, naso-pharyngeal secretions and lymph nodes in East Anglia. *Tubercle, Lond.*, 1970, **51**, 178.

Stokes, E. R., Ingham, H. R. and Selkon, J. B. A screening technique for the detection of nasal carriers of antibiotic-resistant *Staphylococcus aureus*. *J. clin. Path.*, 1970, **23**, 546.

Stoodley, B. J. and Thom, B. T. Observations on the intestinal carriage of *Pseudomonas aeruginosa*. *J. med. Microbiol.*, 1970, **3**, 367.

Taylor, C. E. D. Optical features of immunofluorescence. I. In: *Standardization in immunofluorescence: a symposium*, edited by E. J. Holborow *et al.* Oxford, Blackwell, 1970, p. 15.

Taylor, C. E. D., McSwiggan, D. A. and Miller, D. L. Influenza antibody surveillance. *Abstr. X int. Congr. Microbiol., México., D.F., 1970*, 1970, p. 177.

Taylor, Joan. Infectious infantile enteritis, yesterday and today. *Proc. R. Soc. Med.*, 1970, **63**, 1297.

Taylor, K. W. and Gamble, D. R. Viruses and other toxic factors in the aetiology of diabetes mellitus. *Acta diabet. lat.*, 1970, **7**, Suppl. 1, p. 397.

Thangkhiew, Irene. Studies on some aspects of inducible resistance to macrolide antibiotics. *University of Manchester, M.Sc. Thesis*, 1970.

Thom, B. T. Klebsiella in faeces. [Letter.] *Lancet*, 1970, **ii**, 1033.

Thomas, K. L. and Jones, A. M. Incidence of salmonellae in meat imported from the Republic of Ireland. *Med. Offr*, 1970, **123**, 19.

Thomas, Mair E. M. and Andrews, B. E. Mycoplasma in urogential tract. [Letter.] *Lancet*, 1970, **ii**, 366.

Thomas, Mair E. M. and Mogford, H. E. Salmonellosis in general practice: observations of cases and their households in Enfield. *J. Hyg., Camb.*, 1970, **68**, 663.

Thompson, K. M. and Tobin, J. O'H. Isolation of rubella virus from abortion material. *Brit. med. J.*, 1970, **ii**, 264.

Tobin, Barbara M., Ralston, A. J. and Jones, D. M. Dialyser gaskets. [Letter.] *Brit. med. J.*, 1970, **iii**, 226.

Tomlinson, A. H. Generalized herpes simplex in malnourished children. Addendum: demonstration of herpes simplex viral antigen by immunofluorescence. *J. clin. Path.*, 1970, **23**, 29.

Tomlinson, A. H. Illumination. I. In: *Standardization in immunofluorescence: a symposium*, edited by E. J. Holborow *et al.* Oxford, Blackwell, 1970, p. 5.

Tomlinson, A. H. An interference filter for use with the iodine-quartz lamp to excite fluorescence. In: *Standardization in immunofluorescence: a symposium*, edited by E. J. Holborow *et al.* Oxford, Blackwell, 1970, p. 117.

Tomlinson, A. H. and MacCallum, F. O. The effect of iodo-deoxyuridine on herpes simplex virus encephalitis in animals and man. *Ann. N.Y. Acad. Sci.*, 1970, **173**, 20.

Tomlinson, A. H. and MacCallum, F. O. The incidence of complement-fixing antibody to varicella-zoster virus in hospital patients and blood donors. *J. Hyg., Camb.*, 1970, **68**, 411.

Turner, G. C., Field, A. M., Lasheen, R. A., Todd, R. McL. and White, G. B. B. SH(Australia) antigen in early life. [Abstract.] *J. clin. Path.*, 1970, **23**, 826.

Turner, G. C. and White, G. B. B. The test for SH-Australia antigen in viral hepatitis. [Abstract.] *CXX Meet. path. Soc. Gt Brit., London, 1970* in *J. med. Microbiol.*, 1970, **3** No. 1, Px.

Turner, L. H. Leptospira infections. In: *The husbandry and diseases of calves*, 3rd edition, edited by R. M. Loosemore and J. S. S. Inglis. London, British Veterinary Association, 1970, p. 99.

Turner, L. H. Leptospirosis. III. Maintenance, isolation and demonstration of leptospires. *Trans. R. Soc. trop. Med. Hyg.*, 1970, **64**, 623.

Turner, L. H. and Mohun, A. F. Leptospirosis. [Letter.] *Brit. med. J.*, 1970, **i**, 433.

Valkenburg, H. A., Haverkorn, M. J., Gostlings, W. R. O., Lorrier, J. C., Moor, C. E. de and Maxted, W. R. The relation between M-typability of group A streptococci, virulence and antibody response in general practice. *Zbl. Bakt., I Abt., Orig.*, 1970, **214**, 458.

Valkenburg, H. A. and Maxted, W. R. Variation in the M-antigen of group A streptococci. *Zbl. Bakt., I Abt. Orig.*, 1970, **214**, 317.

Vernon, Enid. Food poisoning and salmonella infections in England and Wales, 1968. *Publ. Hlth, Lond.*, 1970, **84**, 239.

Vitarana, Kamini M. Salmonellae in heat-dried foods, with special reference to desiccated coconut. *University of London, M.Phil. Thesis*, 1970.

Walker, Georgina H. and Tobin, J. O'H. *eds.* Cytomegalovirus infection in the North-West of England: a report on a two-year study. *Arch. Dis. Childh.*, 1970, **45**, 513.

Wallace, J. G. Protamine-sulphate solutions for the detection of brucella antibodies. [Letter.] *Lancet*, 1970, **ii**, 1188.

Wannamaker, L. W., Skjold, S. and Maxted, W. R. Characterization of bacteriophages from nephritogenic group A streptococci. *J. infect. Dis.*, 1970, **121**, 407.

Wasley, G. D. and Rayner, C. F. A. Preservation of *Trichomonas vaginalis* in liquid nitrogen. *Brit. J. vener. Dis.*, 1970, **46**, 323.

White, G. B. B., Lasheen, R. M. and Turner, G. C. Rapid detection of Australia antigen by cross-over electrophoresis. [Letter.] *Lancet*, 1970, **ii**, 368.

Widdowson, Jean P., Maxted, W. R. and Grant, D. L. The production of opacity in serum by group A streptococci and its relationship with the presence of M antigen. *J. gen. Microbiol.*, 1970, **61**, 343. (Also abstract in *J. med. Microbiol.*, 1970, **3**, No. 1, Pviii.)

Wilkinson, A. E. The positive Wassermann reaction: investigation and interpretation. *Brit. J. Hosp. Med.*, 1970, **4**, 47.

Wilkinson, A. E. and Wiseman, C. C. The role of sorbent in the absorbed fluorescent treponemal antibody (FTA/ABS) test. WHO/VDT/RES/70.213, 1970. [Wld Hlth Org. working document.]

Williams, Kathleen and Willis, A. T. A method of performing surface viable counts with *Clostridium tetani*. *J. med. Microbiol.*, 1970, **3**, 639.

Willis, A. T. and Williams, K. Some cultural reactions of *Clostridium tetani*. *J. med. Microbiol.*, 1970, **3**, 291.

Winchester, J. S., Hambling, M. H., Wellsteed, A. J. and Mandal, S. K. Influenza A2/Hong Kong/68 in an infectious diseases unit in Leeds. *Publ. Hlth, Lond.*, 1970, **84**, 140.

Wiseman, R. A., Fleck, D. G. and Woodruff, A. W. Toxoplasmal and toxocaral infections: a clinical investigation into their relationship. *Brit. med. J.*, 1970, **iv**, 152.

Wormald, P. J. The effect of a changed environment on bacterial colonization rates in an established burns centre. *J. Hyg., Camb.*, 1970, **68**, 633.

Books

Baillie, Ann and Gilbert, R. J. *eds. Automation, mechanization and data handling in microbiology.* (*Soc. appl. Bact. tech. Ser. 4.*) London, Academic Press, 1970.

Collins, C. H. and Lyne, P. M. *Microbiological methods*, 3rd ed. London, Butterworths, 1970.

Holborow, E. J., Brighton, W. D., Sander, G. and Taylor, C. E. D. *eds. Standardization in immunofluorescence: a symposium.* Oxford, Blackwell, 1970.

Reports of the Public Health Laboratory Service, including reports of Committees and Working Parties

Dysentery and salmonella infections (excluding typhoid and paratyphoid fevers), issued jointly by the Society of Medical Officers of Health and the Public Health Laboratory Service. *Publ. Hlth, Lond.*, 1970, **84**, 197.

Investigation, surveillance and control of communicable diseases, 6th–18th September, 1970. Course No. 023. London, British Council, 1970.

Precautions against tuberculous infection in the diagnostic laboratory. Appendix to Department of Health and Social Security H.M.(70)60. London, H.M.S.O., 1970.

Studies of the effect of immunoglobulin on rubella in pregnancy: report of the Public Health Laboratory Service Working Party on Rubella. *Brit. med. J.*, 1970, **ii**, 497.

Public Health Laboratory Service Board accounts, 1968–69. *House of Commons Papers* (Session 1969–70), No. 190. London, H.M.S.O., 1970.

Public Health Laboratory Service 1970 Year Book, including annual report for 1969, London, 1970.

Reports of Committees and Working Parties of other organisations to which members of the staff have contributed

INTERNATIONAL COMMITTEE ON NOMENCLATURE OF BACTERIA. A request to the Judicial Commission that *Aerobacter* Beijerinck 1900 and *Aerobacter* Hormaeche and Edwards 1958 be declared rejected generic names, [by] a group of enterobacteriologists and other interested bacteriologists. *Int. J. syst. Bact.*, 1970, **20**, 221.

MINISTRY OF HOUSING AND LOCAL GOVERNMENT and WELSH OFFICE. *Taken for granted: report of the working party on sewage disposal.* London, H.M.S.O., 1970.

SOCIETY FOR WATER TREATMENT AND EXAMINATION. *Water treatment and examination*, edited by W. S. Holden. London, Churchill, 1970.

APPENDIX III

AWARDS AND EXTERNAL OFFICES ACCEPTED BY MEMBERS OF THE SERVICE DURING 1970

Dr. G. I. Watson	President, Royal College of General Practitioners.
Mr. G. Ackland	J. D. Atkinson Memorial Award 1970.
Dr. G. I. Barrow	World Health Organisation Fellowship, tenable in 1971.
Dr. B. W. Barton	Chairman, Derby Area Pathology Committee.
Dr. Yvonne E. Cossart	Member, Advisory Group on Testing for the Presence of Hepatitis Associated Antigen and its Antibody; Member, Blood Transfusion Research Committee Working Party on Post-transfusion Hepatitis.
Dr. D. G. Davies	Chairman, East Cumberland Group Medical Advisory Committee.
Dr. Lynette M. Dowsett	Chairman, Control of Infection Committee, Little Plumstead Hospital; Member, East Anglian Hospital Board Working Party on the Organisation of Pathology Services within the Region.
Dr. C. Dulake	Honorary Senior Lecturer, University of Surrey.
Dr. P. K. Fraser	Chairman, Control of Infection Committee, Ipswich Group Hospitals; Lecturer, Ipswich Civic College.
Dr. J. M. Graham	Honorary Clinical Teacher in Microbiology, Medical School, University of Southampton.
Dr. R. D. Gray	Control of Infection Officer, Newport and East Monmouthshire Hospital Group.
Dr. C. H. L. Howells	Member, Working Party on Methods of Control of Hospital Infection; Member, Executive Committee, Association of Clinical Pathologists (West Mercian Branch); Member, Sub-Committee Birmingham Regional Specialities Pathology Services.
Dr. M. H. Hughes	Vice-Chairman, Hampshire County Health Committee.
Dr. J. G. P. Hutchison	Member, Birmingham Regional Hospital Board Renal Panel.
Mr. W. R. Ivory-Hollingsworth	Member, Medical Laboratory Technicians Board; Member, Council of the Institute of Medical Laboratory Technology.
Dr. S. P. Lapage	Vice-Chairman, International Committee on Systematic Bacteriology; Secretary, World Federation for Culture Collections; Member, Council of the Society for General Microbiology.
Dr. R. H. Leach	Member, Food and Agriculture Organisation/World Health Organisation Team for Bovine Mycoplasmas.
Dr. D. L. Miller	Secretary, Section of Epimediology and Preventive Medicine, Royal Society of Medicine.

Dr. E. R. Mitchell	Member, British Medical Association Consulting Pathologists Group Committee; Member, Medical Microbiology Committee, Royal College of Pathologists; Member, Panel of Examiners in Medical Microbiology, Royal College of Pathologists.
Dr. T. M. Pollock	President, Research Group Advisory Council, Society of Medical Officers of Health.
Dr. B. Rowe	Secretary, Committee of Applied Epidemiology.
Dr. C. E. D. Taylor	Member, Council of the World Association of Anatomic and Clinical Pathology Societies; Chairman, Sub-Committee on Standards in Immunology, Commission on World Standards, World Association of Anatomic and Clinical Pathology Societies; Member, Council of the Association for the Study of Infectious Diseases.
Mr. K. L. Thomas	Member, Council of the Institute of Medical Laboratory Technology; Alternate Member, Medical Laboratory Technicians Board, Professions Supplementary to Medicine.
Dr. G. C. Turner	Member, Council of the Association of Clinical Pathologists; Member, Committee on Microbiology, Association of Clinical Pathologists.
Dr. L. H. Turner	Secretary, Taxomic Sub-Committee on Spirochaetales, Internation Committee on Systematic Bacteriology.

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